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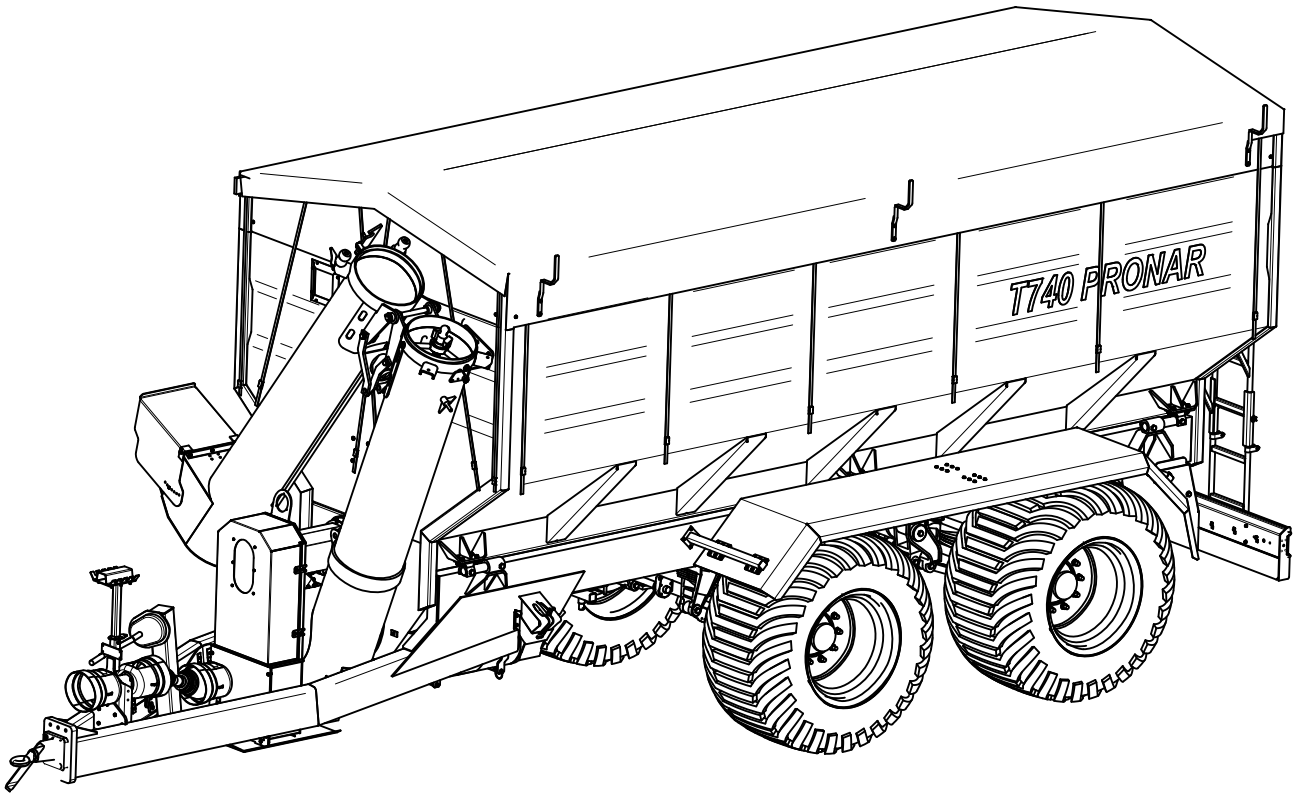
OPERATING INSTRUCTIONS

GRAIN TRANS-SHIPMENT TRAILER

„TANDEM”

T740



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TRANS-SHIPMENT TRAILER

T740

MACHINE IDENTIFICATION

SYMBOL /TYPE: **T740**

SERIAL NUMBER:

S	**Z**	**B**	**7**	**4**	**0**	**0**	**X**	**X**			**X**					

KTM NUMBER: **1026 – 639 – 849 – 202**

INTRODUCTION

Information contained herein is current at date of publication. As a result of improvements, some numerical values and illustrations contained in this publication may not correspond to the factual specification of the machine supplied to the user. The manufacturer reserves the right to introduce design changes in machines produced that facilitate operation and improve the quality of their work, without making minor amendments to these operating instructions. Please send comments and observations on the subject of the design and operation of the machine to the manufacturer. This information enables objective evaluation of the machines produced and provides indications for their further modernisation. Information on significant design changes are passed on to users with the aid of the information insert attached to these operating instructions (annexes).

The operating instructions are an integral part of the machine's documentation. Before using the machine, the user must familiarise himself with the content of these instructions and observe all recommendations. This guarantees safe operation and ensures malfunction free work of the machine. The machine is designed to meet obligatory standards, documents and legal regulations currently in force.

The instructions describe the basic principles of safe use and operation of T740 trans-shipment trailer. If the information contained in the operating instructions needs clarification then the user should refer for assistance to the sale point where the machine was purchased or to the manufacturer.

Manufacturer's address:

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Symbols appearing in these operating instructions

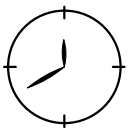
Information, descriptions of danger and precautions and also recommendations and orders associated with user safety instructions are marked:

and also preceded by the word **"DANGER”**. Failure to observe the instructions may endanger the machine operator's or other person's health or life.

Particularly important information and instructions, the observance of which is essential, are distinguished in the text by the sign:

and also preceded either word **"ATTENTION"**. Failure to observe the instructions may lead to damage to the machine as a result of improper operation, regulation or use.

In order to focus the user's attention on the need to perform technical maintenance, the relevant section of the operating instructions is marked with the pictogram:



Additional tips and advice for machine operation are marked:

and also preceded either word **„TIP”**.

Directions used in these operating instructions

Left side – side to the left hand of the operator facing the machine's forward travel.

Right side – side to the right hand of the operator facing the machine's forward travel.

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Deklaracja zgodności WE

My PRONAR Sp. z o.o. deklarujemy z pełną odpowiedzialnością, że maszyna:

Maszyna:	Przyczepa przeładowcza do ziarna „tandem"
Typ:	T740
Nr. fabryczny	.....

do której odnosi się niniejsza deklaracja, spełnia wymagania Dyrektywy Parlamentu Europejskiego i Rady 98/37/WE wprowadzonej do prawa polskiego Rozporządzeniem Ministra Gospodarki z dnia 20 grudnia 2005 r. w sprawie zasadniczych wymagań dla maszyn i elementów bezpieczeństwa (Dz. U. Nr 259, poz. 2170), spełnia wymagania następujących norm zharmonizowanych z w/w dyrektywą:

- PN-EN ISO 12100-1:2005 – Bezpieczeństwo maszyn. Pojęcia podstawowe, ogólne zasady projektowania. Część 1: Podstawowa terminologia, metodyka
- PN-EN ISO 12100-2:2005 – Bezpieczeństwo maszyn. Pojęcia podstawowe, ogólne zasady projektowania. Część 2: Zasady techniczne
- PN- EN 1553:2002 - Maszyny rolnicze – Maszyny rolnicze samobieżne, zawieszane półzawieszane i przyczepiane – Wymagania wspólne dotyczące bezpieczeństwa.

Ta deklaracja zgodności WE traci swoją ważność, jeżeli maszyna zostanie zmieniona lub przebudowana bez pisemnej zgody producenta.

DZIAŁ WDROŻEŃ
Z-ca Kierownika ds. Przyczep
mgr inż. Krzysztof Małaszkiewicz

Narew, dnia 2009-07-07

Miejsce i data wystawienia

Imię, nazwisko osoby upoważnionej
stanowisko, podpis

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SECTION

1 BASIC INFORMATION

IDENTIFICATION
INTENDED USE
FITTINGS
WARRANTY CONDITIONS
TRANSPORT
ENVIRONMENTAL HAZARDS
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1.1 IDENTIFICATION

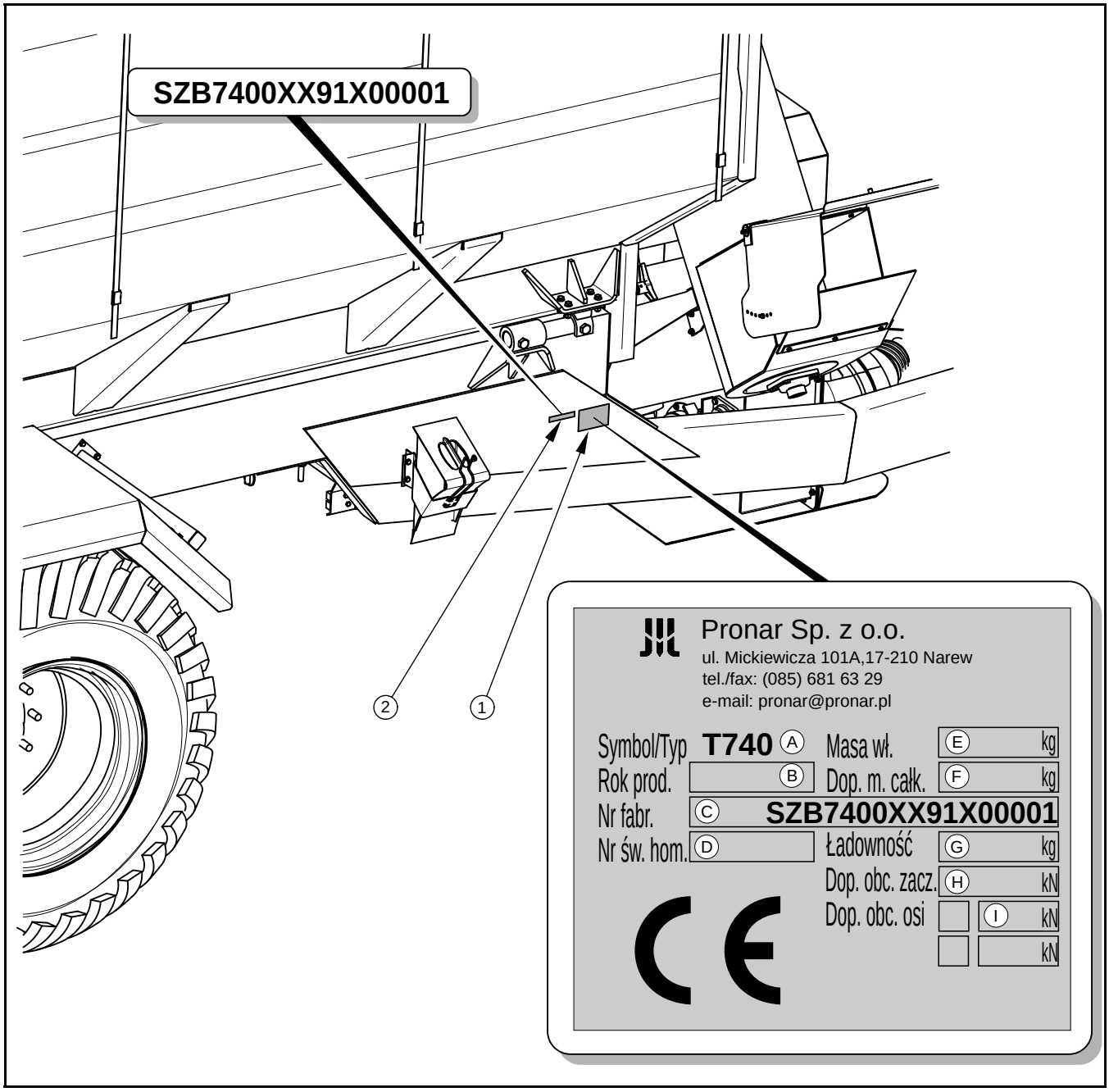


FIGURE 1.1A Location of the data plate and serial number

(1) data plate, (2) serial number

1.1.1 IDENTIFICATION OF TRANS-SHIPMENT TRAILER

The trans-shipment trailer is marked with the data plate (1), located on the right frame brace and the factory number (2) located on a gold painted rectangle. When buying the trans-shipment trailer check that the serial numbers on the machine agree with the number written in the *WARRANTY BOOK*, in the sales documents and in the *OPERATING INSTRUCTIONS*.

The meaning of individual fields of the data plate – figure (*1.1A*) are presented in the table below:

A – machine type (T740),

B – trans-shipment trailer production date,

C – seventeen digit serial number of the machine (VIN),

D – official certificate number (not applicable),

E – machine tare weight,

F – maximum gross weight,

G – carrying capacity,

H – maximum hitch load,

I – maximum vehicle axle load.

1.1.2 AXLE IDENTIFICATION

The factory number of the axle shaft and its type are stamped onto the data plate secured to the axle shaft beam. In the event of ordering a replacement part it you must know the trans-shipment trailer factory number and axle type.

1.1.3 LIST OF SUB-ASSEMBLY FACTORY NUMBERS

TIP

In the event of ordering a replacement part or in the case of the appearance of problems it is often essential to give the factory numbers of parts or the VIN number of the trailer, therefore it is recommended that these numbers are inscribed in the spaces below.

VIN NUMBER:

S	**Z**	**B**	**7**	**4**	**0**	**0**	**X**	**X**			**X**					

FRONT AXLE FACTORY NUMBER

REAR AXLE FACTORY NUMBER

1.2 INTENDED USE

The T740 trans-shipment trailer is constructed according to current safety requirements and engineering standards. The braking system and the light and indicator system meet the requirements of road traffic regulations.

The machine is designed for the transport and trans-shipment of cereals and maize seed grain from combines to transport vehicles. Transporting people, animals or other loose materials is forbidden and regarded as contrary to the intended purpose. During the use of the machine comply with all road traffic regulations and transport regulations in force in the given country, and any breach of these regulations is regarded by the Manufacturer as use of the trans-shipment trailer contrary to its intended purpose.

Using it as intended also involves all actions connected with the safe and proper operation and maintenance of the machine. In connection with this the user is obliged to:

- familiarise himself with the content of the *OPERATING INSTRUCTIONS* of T740 trans-shipment trailer and with the *WARRANTY BOOK* and comply with the recommendations contained in these documents,
- understand the operating principle of the machine's operation and of its safe and proper use,
- Adhere to the established maintenance and regulation plans,
- comply with general safety regulations while working,
- prevent accidents,
- comply with the road traffic regulations and transport regulations in force in a given country, in which the trans-shipment trailer is used,

- familiarise himself with the contents of the operating instructions of the agricultural tractor, articulated telescopic shaft and weigher (if included in trailer equipment) and comply with these instructions.

TABLE 1.1 THE AGRICULTURAL TRACTOR'S REQUIREMENTS

CONTENTS	MEASURED AS	REQUIREMENTS
Brake system		
Pneumatic system 1 - conduit	-	sockets compliant with PN-ISO 1728:2007
Pneumatic system 2 - conduit	-	sockets compliant with PN-ISO 1728:2007
Nominal pressure of the system 1 p.	kPa	600
Nominal pressure of the system 2 p.	kPa	800
Hydraulic system		
Hydraulic oil	-	HL 32
Pressure rating of the system	MPa	16
Oil demand:	l	15
Electrical system		
Electrical system voltage	V	12
Attachment socket	-	7 polar compliant with ISO 1724
Tractor hitches		
Maximum vertical drawbar load	kg	3 000
Other requirements		
Minimum tractor power demand	kW / Horsepower	118 / 160
Cigarette lighter socket (1)	V	12

(1) – *Weigher power supply (additional equipment)*

IMPORTANT!

The trans-shipment trailer must not be used for purposes other than those for which it is intended, in particular:

- for transporting people and animals,
- using the machine to transport and trans-ship any materials other than those listed in the instructions.

The trans-shipment trailer may only be used by persons, who:

- are familiar with the contents of this publication and with the contents of the agricultural tractor service instructions,
- have been trained in trans-shipment trailer service and safe operation,
- have the required authorisation to drive and are familiar with the road traffic regulations and transport regulations.

1.3 FITTINGS

TABLE 1.2 T740 TRANS-SHIPMENT TRAILER EQUIPMENT

FITTINGS	STANDARD	OPTION
OPERATING INSTRUCTIONS	•	
WARRANTY BOOK	•	
EZ 400 WEIGHER OPERATING INSTRUCTIONS		•
Complete set of wall extensions.	•	
Electrical system without weigher	•	
Electrical system with weigher		•
Pneumatic system 1 conduit		•
Pneumatic system 2 conduit	•	

FITTINGS	STANDARD	OPTION
Pneumatic system 2 conduit with ALB regulator		•
Tarpaulin cover	•	
Mudguards set	•	
Rotating drawbar eye ∅50 mm	•	
ball drawbar ∅80 mm.		•
Wheel wedges	•	
Slow-moving vehicle warning sign		•
Warning reflective triangle		•
Articulated telescopic shaft B&P 7106081CE007098	•	

1.4 WARRANTY CONDITIONS

"PRONAR" Sp. z o.o. in Narew guarantees the reliable operation of the machine when it is used according to the technical usage instructions described in the *OPERATING INSTRUCTIONS*. Faults discovered during the warranty period will be rectified by the Warranty Service within no more than 14 working days of the machine being received for repair by the Warranty Service, or within another agreed time.

The guarantee does not cover those parts and sub-assemblies of the machine which are subject to wear in normal usage conditions, regardless of the warranty period. Consumables include the following parts/sub-assemblies:

- drawbar eye,
- pneumatic system connector filters,
- tyres,
- chains,
- brake pads,

- bulbs and LED lamps,
- seals,
- bearings.

The warranty service only applies to such cases as: mechanical damage which is not the user's fault, factory defects of parts, etc.

In the event of damage arising from:

- mechanical damage which is the user's fault, caused by road accidents,
- by inappropriate use, regulation or maintenance, use of the trans-shipment trailer for purposes other than those for which it is intended,
- use of damaged machine,
- repairs carried out by unauthorised persons, improperly carried out repairs,
- making unauthorised alterations to machine construction,

the user will lose the right to warranty service.

TIP

Demand that the seller carefully and precisely fills out the *WARRANTY BOOK* and guarantee repair coupons. A missing date of purchase or sale point stamp, may make the user ineligible for any warranty repair or refund.

The user is obliged to report immediately on noticing any wear in the paint coating or traces of corrosion, and to have the faults rectified whether they are covered by the guarantee or not. Detailed guarantee regulations are contained in the *WARRANTY BOOK* attached to each machine.

Modification of the trans-shipment trailer without the written consent of the Manufacturer is forbidden. In particular, do NOT weld, drill holes in, cut or keep the main construction elements of the machine, which have a direct impact on the machine operation safety.

1.5 TRANSPORT

The trans-shipment trailer is ready for sale in a completely assembled state and does not require packing. Packing is only required for the machine's technical and any extra fittings.

ATTENTION!

When transporting independently, the user must familiarise himself with the content of these instructions and observe their recommendations. When being transported on a motor vehicle the trans-shipment trailer must be mounted on the vehicle's platform in accordance with the transport safety requirements. The driver of the vehicle should take particular care while driving. This is due to the vehicle's centre of gravity shifting upwards when loaded with the machine.

The trailer is delivered to the user either transported on a vehicle or, after being attached to a tractor, independently (towed). In the event of being towed, familiarise oneself with the contents of trans-shipment trailer operating instructions and comply with its these recommendations. The towing speed should be adapted to the current road conditions, but must not be greater than the maximum design speed.

When loading and unloading the trans-shipment trailer, comply with the general principles of workplace health and safety for reloading work. Persons operating reloading equipment must have the qualifications required to operate these machines.

The windrower should be attached firmly to the platform of the vehicle using straps or chains fitted with a tightening mechanism. The fastening equipment used must have a valid safety certificate. Wedges or other objects without sharp edges should be placed under the wheels of the trans-shipment trailer to prevent it from rolling. The wedges must be fixed to the platform of the vehicle. During reloading work, particular care should be taken not to damage parts of the machine's fittings or the lacquer coating.

1.6 ENVIRONMENTAL HAZARDS

A hydraulic oil leak constitutes a direct threat to the natural environment owing to its limited biodegradability. While carrying out maintenance and repair work which involves the risk of an oil leak, this work should take place on an oil resistant floor or surface. In the event of oil leaking into the environment, first of all safeguard the source of the leak, and then remove the leaked oil using available means. Remaining oil should be removed using sorbents, or by mixing the oil with sand, sawdust or other absorbent materials. The oil pollution, once gathered up, should be kept in a sealed, marked, hydrocarbon resistant container, and then passed on to the appropriate oil waste recycling centre. The container should be kept away from heat sources, flammable materials and food.

Oil which has been used up or is unsuitable for further use owing to a loss of its properties should be stored in its original packaging in the conditions described above.

1.7 WITHDRAWAL FROM USE

In the event of decision by the user to withdraw the trans-shipment trailer from use, comply with the regulations in force in the given country concerning withdrawal from use and recycling of machines withdrawn from use.

When spare parts are changed, worn out or damaged parts should be taken to a collection point for recyclable raw materials. Hydraulic oil should be taken to the appropriate facility dealing with the re-use of this type of waste.

SECTION

2 SAFETY IN USE

BASIC INFORMATION CONCERNING SAFE OPERATION OF THE MACHINE
SAFETY DURING REPAIR AND MAINTENANCE WORK
DANGERS DURING TRANS-SHIPMENT WORK
HITCHING, UNHITCHING
SAFETY PRINCIPLES WHEN WORKING WITH TYRES
DANGERS DURING TRAVEL
OPERATION OF ARTICULATED TELESCOPIC SHAFT
SAFETY TIPS FOR HYDRAULIC CLUTCH OPERATION
DESCRIPTION OF MINIMAL RISK
INFORMATION AND WARNING STICKERS

2.1 BASIC INFORMATION CONCERNING SAFE OPERATION OF THE MACHINE

- Before using the trans-shipment trailer the user should thoroughly acquaint himself with the content of these instructions and the articulated telescopic shaft instructions. While using the machine, follow all the recommendations contained in these documents.
- The trans-shipment trailer may only be used and operated by persons qualified to drive agricultural tractors and trained in the use of the machine.
- If the information contained in the operating instructions is difficult to understand, contact a seller who runs an authorised technical service on behalf of the manufacturer, or contact the manufacturer directly.
- Careless and improper use and operation of the trailer, and non-adherence to the recommendations included in these instructions are dangerous to health.
- Be warned that a minimal risk does exist, and for this reason the fundamental basis for using this machine should be the application of safety principles and sensible behaviour.
- The trans-shipment trailer must never be used by persons, who are not authorised, including children and people under the influence of alcohol or drugs.
- Non-adherence to the principles of safe use creates a danger for the health and life of the operator and others.
- Do NOT use the trans-shipment trailer for other than intended purpose. Anyone who uses the machine other than the way intended takes full responsibility for himself for any consequences of this use. Use other than intended means using the machine in any way other than that specified in the operating instructions.
- Before using the trailer always check its technical condition, especially in terms of safety. In particular, check the drawbar eye and the drawbar, axle system, signalling lights, safety guards, correct mounting of conveyor and connected hydraulic and brake system elements.

- The trailer may only be used when all the safety guards and other protective elements are technically sound and correctly positioned. In the event of loss or destruction of the safety guards, they must be replaced with new ones.
- When operating the machine wear protective gloves and use the appropriate tools.
- In the event of any fault or damage whatsoever, do not use the machine until the fault has been corrected. Do NOT use damaged trans-shipment trailer.
- While walking or standing on trans-shipment trailer or in the container do NOT use mudguards and wheels etc. for this purpose. Steps and platforms are designed for use while working on trailer. Trans-shipment trailer and agricultural tractor must at this time be immobilised with parking brake, articulated telescopic shaft disconnected and the tractor cab closed and protected against access of unauthorised persons. Trans-shipment trailer should be additionally protected with the use of wedges.

2.2 SAFETY DURING REPAIR AND MAINTENANCE WORK

- Any modification to the trans-shipment trailer frees PRONAR Narew from any responsibility for damage or detriment to health, which may arise as a result.
- It is recommended that necessary repairs to trans-shipment trailer should be undertaken by specialised workshops. During the warranty period, any repairs may only be carried out by a Warranty Service authorised by the manufacturer.
- In the event of a fault in the hydraulic or pneumatic system, do not use the trans-shipment trailer until the fault has been remedied. There must not be any leaks of hydraulic oil.
- Repair, maintenance and cleaning work should be carried out with the tractor's engine switched off and the ignition key removed. Ensure that unauthorised persons do not have access to the tractor's cab.
- Unauthorised regulation of rear wheel alignment is strictly forbidden. Incorrect alignment leads to accelerated tyre wear and hinders steering.

- Do NOT change the settings of bolts placed on axle body limiting angle of axle turning (turning block bolts are set in the factory). Change of bolt settings may cause damage to braking system elements and damage to tyres.
- Regularly check the condition of nut and bolt connections in particular connections of drawbar eye with drawbar and wheel nuts.
- Before welding or electrical work trans-shipment trailer should be disconnected from the power supply. Conduit supplying lighting system and weigher should be disconnected from tractor supply sockets. Load cell shall be dismantled (in the event of electric welding), if not, it may be damaged. The paint coating should be cleaned. Burning paint fumes are poisonous for people and animals. Welding work should be carried out in a well lit and well ventilated space.
- During welding work pay attention to flammable or fusible elements (parts of the pneumatic, electric and hydraulic systems, plastic parts). If there is a risk that they will catch fire or be damaged, they should be removed or covered with non-flammable material before commencing welding work.
- Should it be necessary to change individual parts, use only those parts indicated by the manufacturer. Non-adherence to these requirements may cause danger to the health and the user's and other people's lives, and also damage the hook trailer.
- After completing work connected with greasing, remove excess oil or grease.
- Servicing and repair work should be carried out in line with the general principles of workplace health and safety. In the event of injury, the wound must be immediately cleaned and disinfected. In the event of more serious injuries, seek a doctor's advice.
- In the event of work requiring the trans-shipment trailer to be raised, use properly certified hydraulic or mechanical lift jacks for this purpose. After lifting the trans-shipment trailer, stable and durable supports must also be used. Work must not be carried out under a machine which has only been raised with a lift jack.
- The trans-shipment trailer must not be supported using fragile elements (bricks or concrete blocks).

- Do NOT make repairs to drawbar eye (straightening, repairing or welding). Damaged drawbar eye should be replaced.
- Reduce the oil or air pressure in the trans-shipment trailer before dismantling the hydraulic or pneumatic elements.
- Regularly check the technical condition of the connections and the hydraulic and pneumatic leads.
- In the event of injuries being caused by pressurised hydraulic oil, contact a doctor immediately. Hydraulic oil may find its way under the skin and cause infections.
- After changing the hydraulic oil, the used oil should be properly disposed of.

2.3 DANGERS DURING TRANS-SHIPMENT WORK

- The trans-shipment trailer is not intended or designed for transporting people or animals.
- The trans-shipment trailer maximum carrying capacity must not be exceeded. Exceeding the carrying capacity may lead to damage to the machine, loss of stability while driving, scattering of the load and danger while driving. The braking system is adjusted to the gross weight, exceeding the weight limit causes drastic reduction of basic braking effectiveness.
- The arrangement of the load may not cause an overload on the axle or hitch system of the trans-shipment trailer or tractor.
- Do NOT move off or drive with extended front conveyor.
- Incorrect loading of trans-shipment trailer may cause deterioration of machine steering characteristics and braking action.
- Do NOT be in the load box during loading and unloading.
- Do NOT be in the danger zone i.e. near working auger conveyor, between tractor and trans-shipment trailer and near to trans-shipment system drive elements.

2.4 HITCHING, UNHITCHING

- Be especially careful when attaching the machine. Ensure appropriate visibility and check that persons assisting in hitching the machine are at a safe distance from danger zone.
- When attaching, there must be nobody between the trans-shipment trailer and the tractor.
- The trans-shipment trailer and tractor must not be attached if the hydraulic oil in the two machines is of different types.
- While connecting the trailer to the tractor, use the appropriate hitch. The height of the trans-shipment trailer drawbar eye should be optimally adjusted to the height of the hitch. After hitching the trailer check the drawbar eye safeguard.
- When connecting the hydraulic conduits to the tractor, make sure that the hydraulic systems of the tractor and trans-shipment trailer are not under pressure.
- After completing trans-shipment trailer hitching, the support leg must be maximally raised and mechanical raising/lowering crank placed in neutral position.
- While lowering the support, take particular care with regard to the danger of being crushed.
- The agricultural tractor to which the trans-shipment trailer shall be hitched must fulfil the requirements stipulated by the trailer's Manufacturer.
- When disconnected from the tractor the trans-shipment trailer must be secured by parking brake and wedges.

2.5 SAFETY PRINCIPLES WHEN WORKING WITH TYRES

- Check the tyre pressure regularly.
- When working with tyres, the trans-shipment trailer must be immobilised with the parking brake and prevented from moving by placing wedges under the wheels. A wheel may be taken off the trailer axle only when the trailer is not loaded.

- Repair work on the wheels or tyres should be carried out by persons trained and entitled to do so. This work should be carried out using appropriately selected tools.
- Regularly inspect the tightness of nuts securing the wheel to the axle according to the recommendations of the axle manufacturer.
- After removing a wheel and each time after 50 – 100 kilometres are covered, check the tightness of wheel nuts.
- Pressure and tyres should be also checked after the whole day of intensive work. Please note that higher temperatures could raise tire pressure by as much as 1 bar. At high temperatures and pressure reduced load or speed. Do not release air from warm tyres to adjust the pressure or the tyres will be underinflated when temperatures return to normal.
- Do not exceed the trailer's maximum design speed.

2.6 DANGERS DURING TRAVEL

- Ensure that the braking force regulator is set in the correct position.
- Adjust travel speed to the prevailing road conditions, trailer loading and road traffic regulations limits, and other limitations.

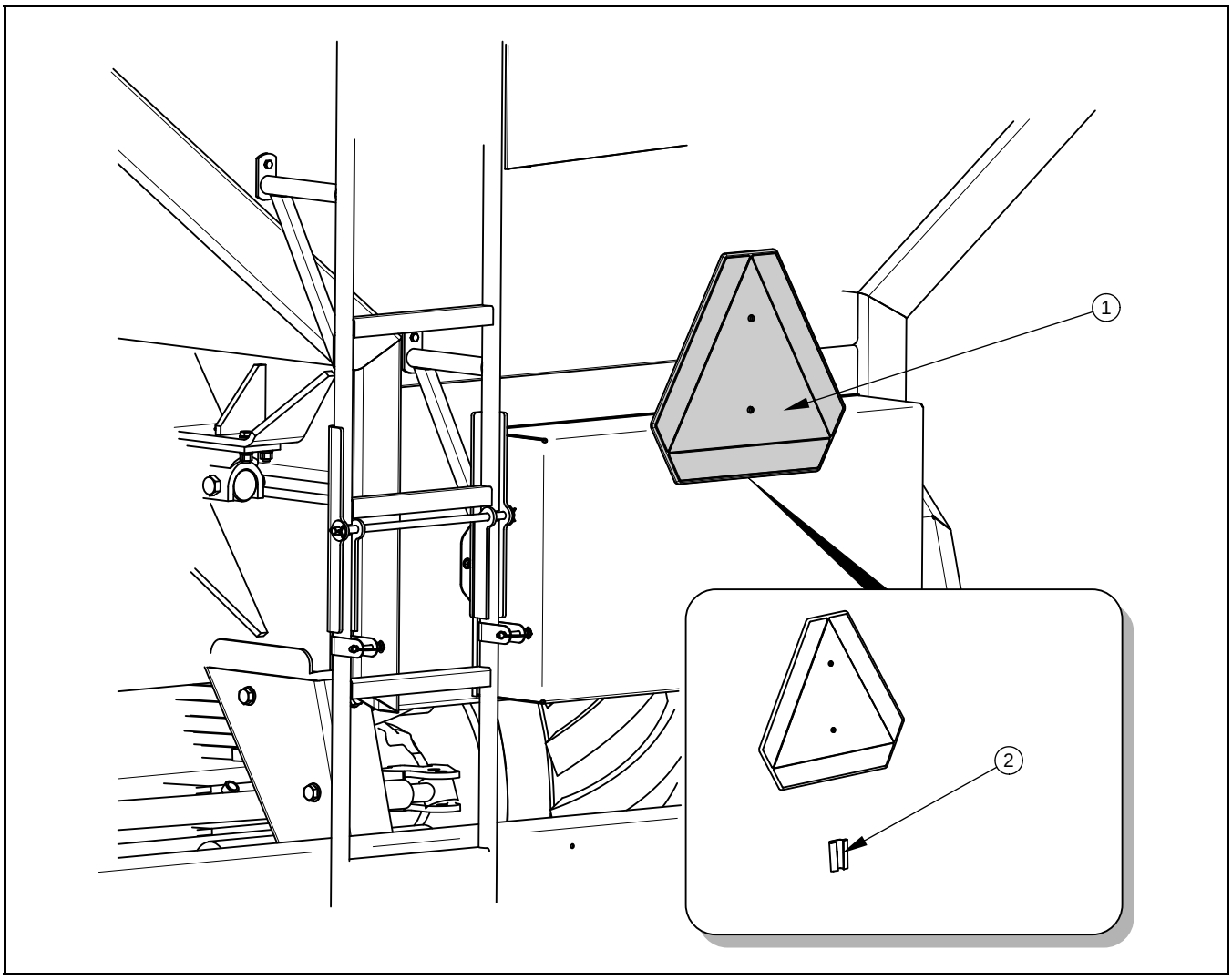


FIGURE 2.1A Positioning of warning sign

(1) warning sign, (2) attachment point

- While driving on public roads the trailer must be fitted with a certified or authorised reflective warning triangle.
- When travelling on public roads, respect the road traffic regulations.
- Exceeding the maximum load capacity of the trans-shipment trailer may damage it, and also threaten the safety of traffic and reduces the effectiveness of braking action.
- During reversing one should use the assistance of another person. During manoeuvring the person helping must stay at a safe distance from the danger zone and be visible all the time to the driver.

- While driving on public roads the trans-shipment trailer shall be marked with a warning triangle distinguishing slow-moving vehicles. The warning sign shall be attached to the attachment point (2) – figure (*2.1A*).
- When disconnected from the tractor the trans-shipment trailer must be secured by parking brake and wedges.
- Do NOT move off or drive when support is lowered.

2.7 OPERATION OF ARTICULATED TELESCOPIC SHAFT

- While reversing and during turns, the trans-shipment trailer's drive must be disengaged.
- Do NOT leave the tractor cab, when the machine drive is engaged.
- The articulated telescopic shaft has markings on the casing, indicating which end of the shaft shall be connected to the tractor.
- Never use a damaged articulated telescopic shaft, it may cause an accident. A damaged shaft must be repaired or replaced.
- Disconnect the drive shaft each time when it is not necessary to drive the machine, or when the tractor and trans-shipment trailer are at an unsuitable angle to each other.
- The chains preventing the shaft cover from turning while the shaft is working, shall be secured to a fixed element of trans-shipment trailer structure.
- Do NOT use the securing chains to support the shaft while machine is parked or when transporting the spreader.
- Before using the machine, the user should thoroughly acquaint himself with the articulating telescopic shaft instructions and adhere to the recommendations contained in them.
- The trans-shipment trailer may only be connected to the tractor with the aid of the appropriately selected articulated telescopic shaft recommended by the Manufacturer.
- The driveshaft must be equipped with a cover. Do NOT use the shaft with damaged or missing guards.

- After connecting shaft ensure that it is correctly and safely connected to the tractor and to the trans-shipment trailer.
- Before starting the machine make sure that there are no bystanders (especially children) in the danger zone. The machine operator is obliged to ensure proper visibility of the machine and the working area.
- When using the trans-shipment trailer and power takeoff shaft, do not use PTO rotation speed greater than 1000 revs/min. Do NOT overload shaft and machine and also engage the clutch suddenly. Before starting articulated telescopic shaft make certain that the PTO shaft rotation direction is correct.
- Before disconnecting the shaft, turn off the tractor engine and remove the key from the ignition.
- Do NOT wear loose clothing, straps or whatever may become wrapped round the rotating drive shaft. Contact with rotating articulated telescopic shaft may cause severe injuries.
- Do NOT go over and under the shaft or to stand on it equally during work as also when the machine is parked.

2.8 SAFETY TIPS FOR HYDRAULIC CLUTCH OPERATION

- The user should ensure that for operation, maintenance and repairs only authorised persons are employed, who are familiar with the mounting and maintenance instructions, understand them and observe them in order to:
    - ⇨ avoid physical danger and health risk to user and to third persons,
    - ⇨ ensure operational safety of drive units,
    - ⇨ Eliminate danger to the environment through incorrect machine operation.
- Conax clutch should be operated, maintained and repaired exclusively by authorised, trained and instructed personnel.
- All work on Conax clutch may only be performed with disconnected drive engine. Secure engine against repeated, unintentional starting.
- If during clutch operation an unusual, disturbing sound or vibration is noticed, immediately stop machine.

- Permissible loading and maximum revs may not be exceeded.
- Do not exceed or reduce recommended connection pressures. In the event of insufficient pressure the clutch slips, whereas excessively high pressure may destroy the clutch. Equally application of short lasting high-pressure impact, e.g. in order to remove blockages is forbidden.
- On no account may oil or grease come in contact with abrasive surfaces, if they do the clutch will not achieve the required rotation moment.
- Abrasive coatings may not be cleaned with solvents, i.e. benzene, acetone or kerosene. If the coating is contaminated with oil, it must be replaced.
- Cleaning substances may not come into contact with the clutch.
- The clutch may not be cleaned under running water, e.g. hose or nozzle jet with hot steam stream.
- Attention! During maintenance and repair work there is a danger of burning by clutch, which has heated up during work.
- Attention should be given to the tightness of oil conduits and connections in steering parts.

2.9 DESCRIPTION OF MINIMAL RISK

Pronar Sp. z o. o. in Narew has made every effort to eliminate the risk of accidents. There is, however, a certain minimal risk which could lead to an accident, and this is connected mainly with the actions described below:

- using the trans-shipment trailer for purposes other than those for which it is intended,
- being between the tractor and the trans-shipment trailer while the engine is running and when the machine is being hitched,
- being on the machine while the engine is running,
- operating the trans-shipment trailer with the safety guards removed or faulty,
- not keeping a safe distance during loading or unloading of trailer,
- operation of machine by unauthorised, untrained or intoxicated persons,

- cleaning, maintenance and technical inspection of trans-shipment trailer.

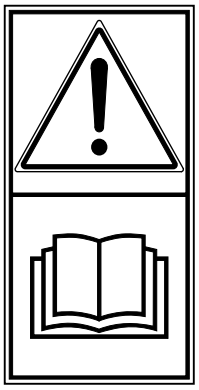
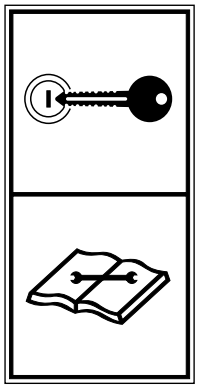
The minimal risk may be kept to a minimum by following the recommendations below:

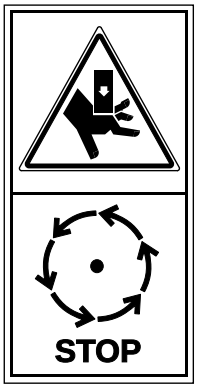
- prudent and unhurried operation of the machine,
- sensible application of the remarks and recommendations contained in the operating instructions,
- keeping a safe distance from forbidden or dangerous places during unloading, loading and hitching machine,
- carrying out repair and maintenance work in line with operating safety principles,
- carrying out repair and maintenance work by persons trained to do so,
- using strictly suited protective clothing,
- ensuring unauthorised persons have no access to the machine, especially children.
- maintaining the machine in due technical condition.

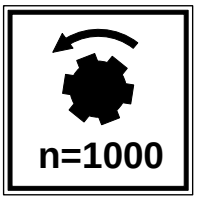
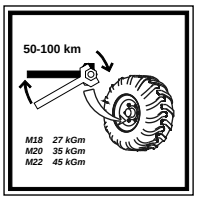
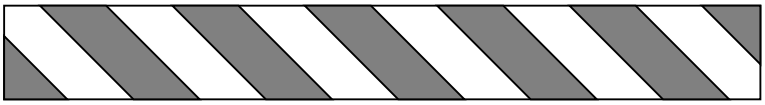
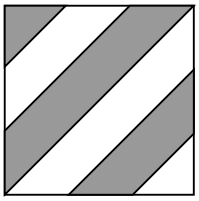
2.10 INFORMATION AND WARNING STICKERS

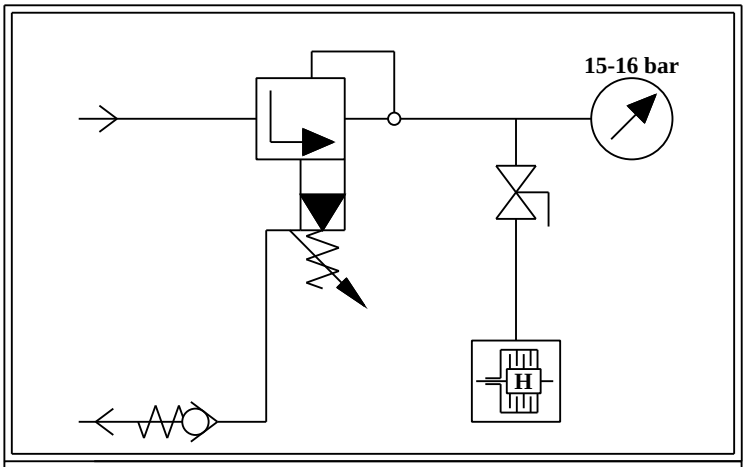
The trans-shipment trailer is marked with information and warning stickers referred to in table (*2.1)*. The symbols are positioned as presented in figure *(2.2A).* Throughout the time in use, the user of the machine is obliged to take care that notices and warning and information symbols located on the trans-shipment trailer are clear and legible. In the event of their destruction, they must be replaced with new ones. Stickers with notices and symbols are available from the manufacturer, or from the retailer where the machine was purchased. New assemblies, changed during repair, must be labelled once again with the appropriate safety signs.

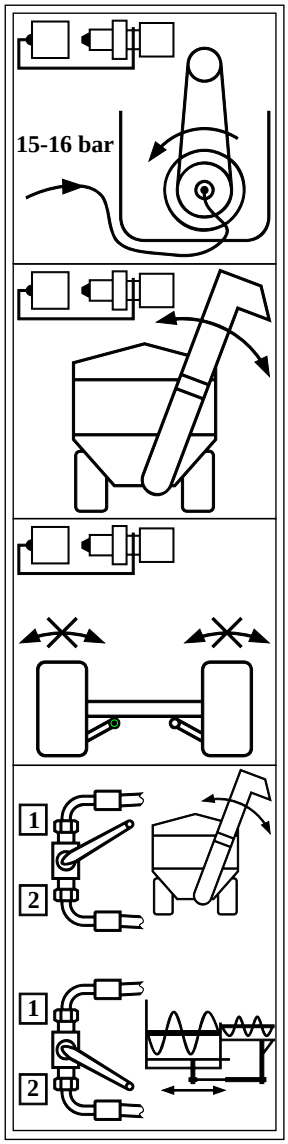
TABLE 2.1 INFORMATION AND WARNING STICKERS

ITEM	STICKER	DESCRIPTION
1		Attention! Before starting work, familiarise yourself with the contents of the *OPERATING INSTRUCTIONS.*
2		Before beginning servicing or repairs, consult operating instructions, switch off engine and remove key from ignition.
3		Danger of being pulled in by rotating auger conveyors. Do not approach and do not place hands near rotating mechanisms.

ITEM	STICKER	DESCRIPTION
4		Danger of crushing Do not place limbs in crushing danger zone.
5		Attention! Do not stand on auger conveyors.
6		Danger of being pulled in by rotating auger conveyors.
7		Danger of crushing to limbs. Take care when in the vicinity of rotating machine elements.

ITEM	STICKER	DESCRIPTION
8		Before entering load box or on platform disconnect tractor engine and remove key from ignition.
9		Maximum rotation speed of Power Takeoff Shaft
10		Check correct tightness of nut and bolt connections on axles.
11		Grease according to the recommendations in the operating instructions
12		Clearance warning sticker.
13		Clearance warning sticker.
14	T740 PRONAR	Machine type

ITEM	STICKER	DESCRIPTION
15	 Ciśnienie robocze sprzęgła hydraulicznego 15-16 bar. Ciśnienie przy wyłączonym sprzęgle max. 1,5 bar. Zaleca się łączyć przewód powrotny sprzęgła hydraulicznego pod wolny zlew ciągnika. Po zagregowaniu przyczepy z innym typem ciągnika sprawdzać ciśnienie robocze sprzęgła 15-16 bar i w razie potrzeby wyregulować. Arbeitsdruck der hydraulischen Kupplung 15-16 bar. Arbeitsdruck bei der eingeschaltenen Kupplung max. 1,5 bar. Man empfiehlt eine Rücklaufleitung unter freien Rückkehr des Schleppers zu binden. Bei der Aggregation des Anhängers mit dem anderen Typ des Schleppers sollte den Arbeitsdruck der hydraulischen Kupplung 15-16 bar geprüft werden und im Fall der Notwendigkeit - reguliert werden.	Hydraulic clutch operation information sticker.

ITEM	STICKER	DESCRIPTION
16		Hydraulic connection function and hydraulic valves designation information sticker.
17	1 2	Hydraulic valve lever position.
18	3000 kg	Maximum vertical drawbar load
19	240 kPa	Air pressure in the tyres

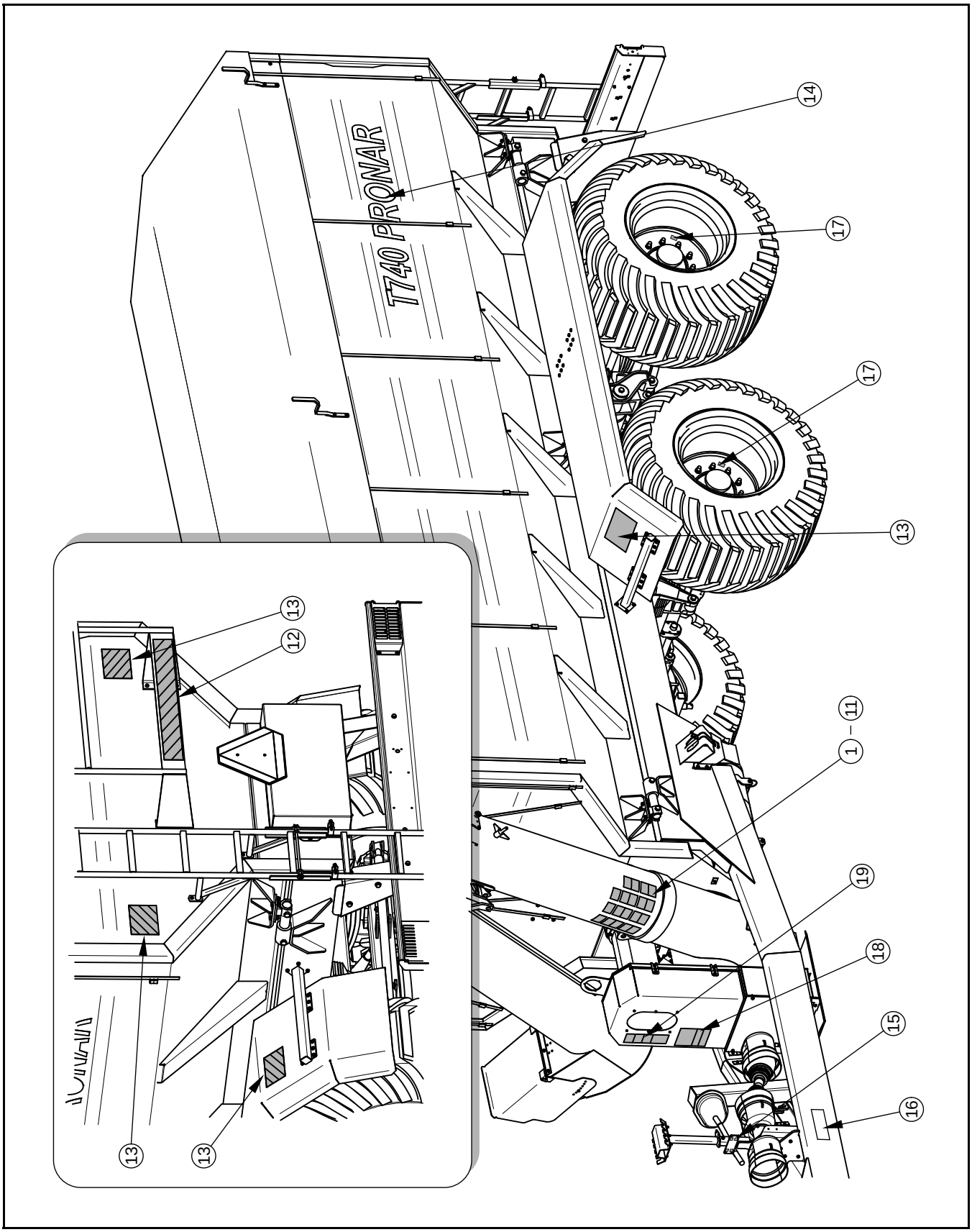


FIGURE 2.2A Locations of information and warning stickers.

Labelling in line with table (2.1).

SECTION

3

CONSTRUCTION AND PRINCIPLE OF OPERATION

SPECIFICATION
CHASSIS
LOAD BOX
FRONT CONVEYOR
FRONT CHAIN TRANSMISSION
FRONT GEAR WHEEL TRANSMISSION
REAR CHAIN TRANSMISSION
WORKING BRAKE
PARKING BRAKE
TURNING INTERLOCK HYDRAULIC SYSTEM
SLIDE BOLT AND CONVEYOR HYDRAULIC SYSTEM
HYDRAULIC CLUTCH SYSTEM
LIGHTING ELECTRIC SYSTEM
WEIGHER ELECTRIC SYSTEM

3.1 SPECIFICATION

TABLE 3.1 TECHNICAL SPECIFICATION OF STANDARD FITTINGS

CONTENTS	UNIT	T740
Dimensions		
Total length	mm	9,142
Width	mm	2,900
Height	mm	3 650
LOAD BOX DIMENSIONS		
Length	mm	6,038
Width	mm	2,530
Maximum height	mm	2 570
Technical specification		
LOAD BOX CAPACITY	m^3	28
Maximum design carrying capacity	kg	15,300
Maximum gross weight	kg	23,000
Tare weight	kg	7,700
Maximum design speed	km/h	40
Axle base	mm	1,810
Tyres		
Tyre	-	700/50-26.5 16PR
Load capacity index	-	174 A8
Air pressure in the tyres	kPa	240
Other information		
Electrical system voltage	V	12
Axle track	mm	2,200
Permissible hitching system loading	kg	3,000
Drawbar attachment point lift	mm	407 – 480 – 553
Minimum clearance	mm	330
Lift of load surface	mm	3,400
Hydraulic oil demand	l	15
Minimum tractor power demand	KM	160

CONTENTS	UNIT	T740
Maximum PTO speed	$revs^{-1}$	1,000
Minimal clutch working pressure	bar	15
Maximum clutch working pressure	bar	16

3.2 CHASSIS

Trans-shipment trailer chassis is shown on figure (*3.1A*). The frame (1) is made as a welded structure from steel profiles. The main support elements are two longitudinal rails connected with crossbars. To the frame is welded the drawbar longitudinal rails, at the end of which is the hitching eye plate and drawbar eye (5). On the left side of the drawbar is screwed the support with two gear mechanism.

At the rear part of the frame the suspension is secured (2) tandem type with parabola leaf springs. The rear axle (4) is made as a turning axle with a hydraulic interlock system for trailer reversing.

Depending on installed electrical system accessories, weight simulators (10) or loading link cells are secured in 6 sockets in the upper part of the frame. On them is placed the trans-shipment trailer load box.

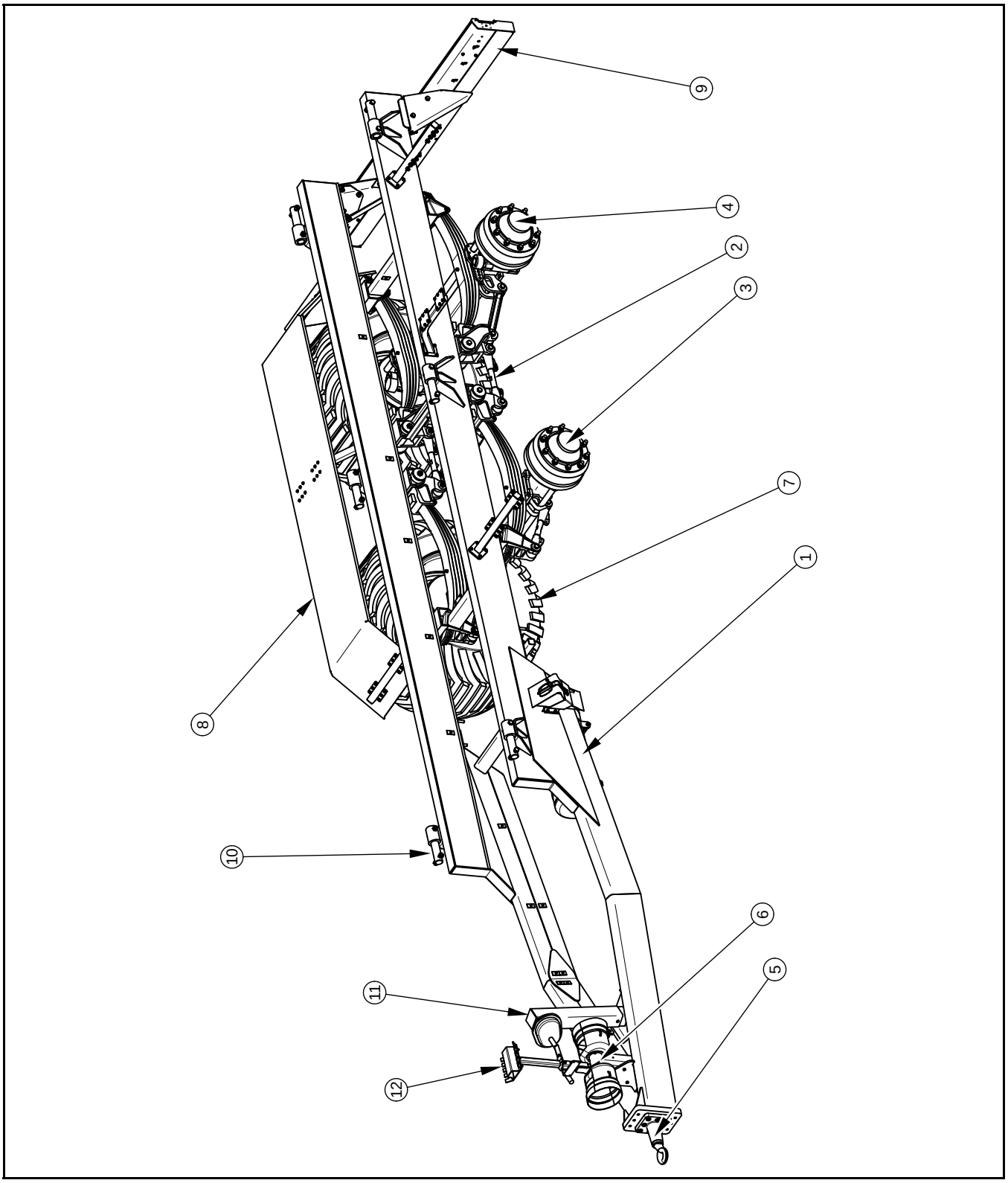


FIGURE 3.1A Trans-shipment trailer chassis

(1) lower frame, (2) suspension, (3) front axle, (4) rear axle, (5) drawbar eye, (6) PTO connection, (7) wheel, (8) mudguard, (9) rear lighting beam, (10) weight simulator / loading link cell, (11) support, (12) conduit bracket

3.2.1 DRAWBAR EYE

As a standard, the T740 trans-shipment trailer is equipped with rotating eye of internal diameter ∅50 mm. At the client's request the machine may be equipped with ball hitch of diameter ∅80 mm. Both types of hitching connections are secured to the head plate (3) of the drawbar with 6 bolts. The position of the eye may be adjusted depending on the height of the hitch on the agricultural tractor.

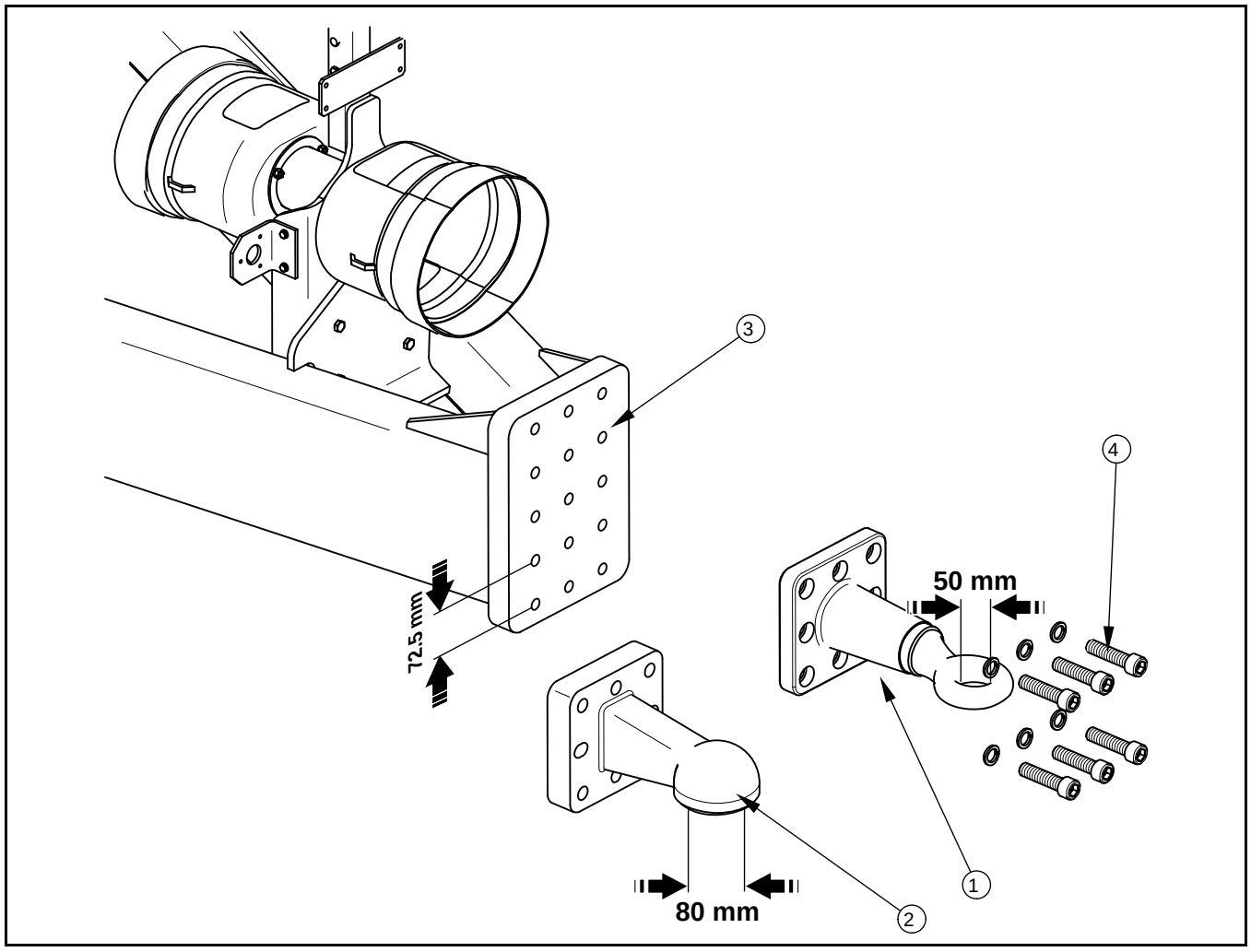


FIGURE 3.2A Drawbar eye

(1) rotating drawbar eye ∅50 mm, (2) ball hitch ∅80 mm, (3) drawbar head plate, (4) securing bolts

3.2.2 TRAILER SUPPORT

Support (1) of trans-shipment trailer is mounted on the left side on drawbar longitudinal rail. It is designed to support an unhitched machine and set height of the drawbar during hitching to agricultural tractor. When travelling the support must be set in the transport position

maximally raised and secured using pin (5), and crank (3) setting neutral position (A). The support is equipped with two gear gearing mechanism. Setting is changed by pulling crank to position (C) or pressing it into position (B).

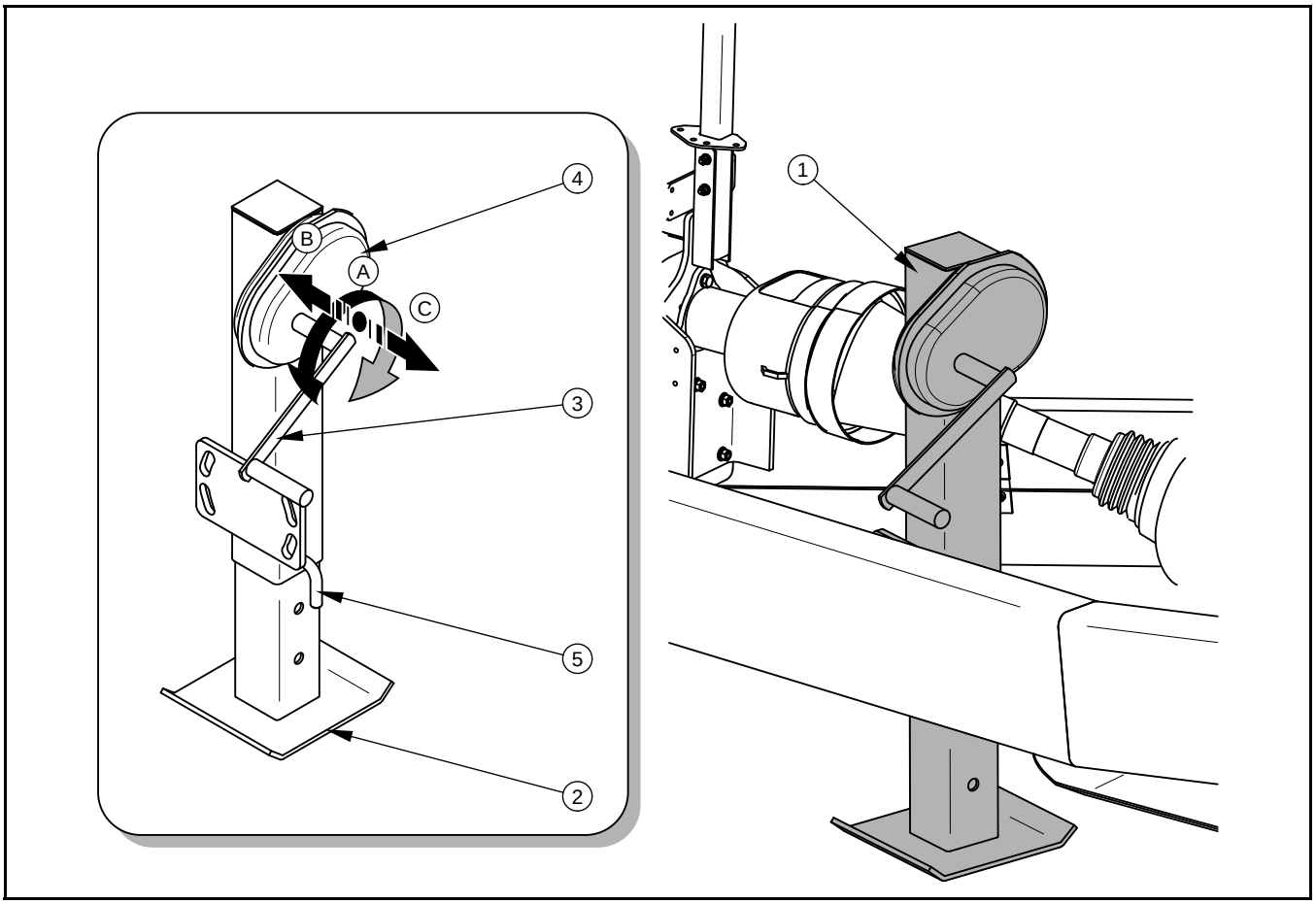


FIGURE 3.3A Trans-shipment trailer support

(1) support (2) support foot, (3) crank, (4) gearing, (5) securing pin, (A) neutral position (B) gear position I , (C) gear position II

TIP

Permissible vertical loading of support KRA 750 is 7,500 kg.

IMPORTANT!

Before moving off, check that the support is maximally raised, and the crank is set in neutral position (A). The support foot must be additionally secured using a linchpin.

3.3 LOAD BOX

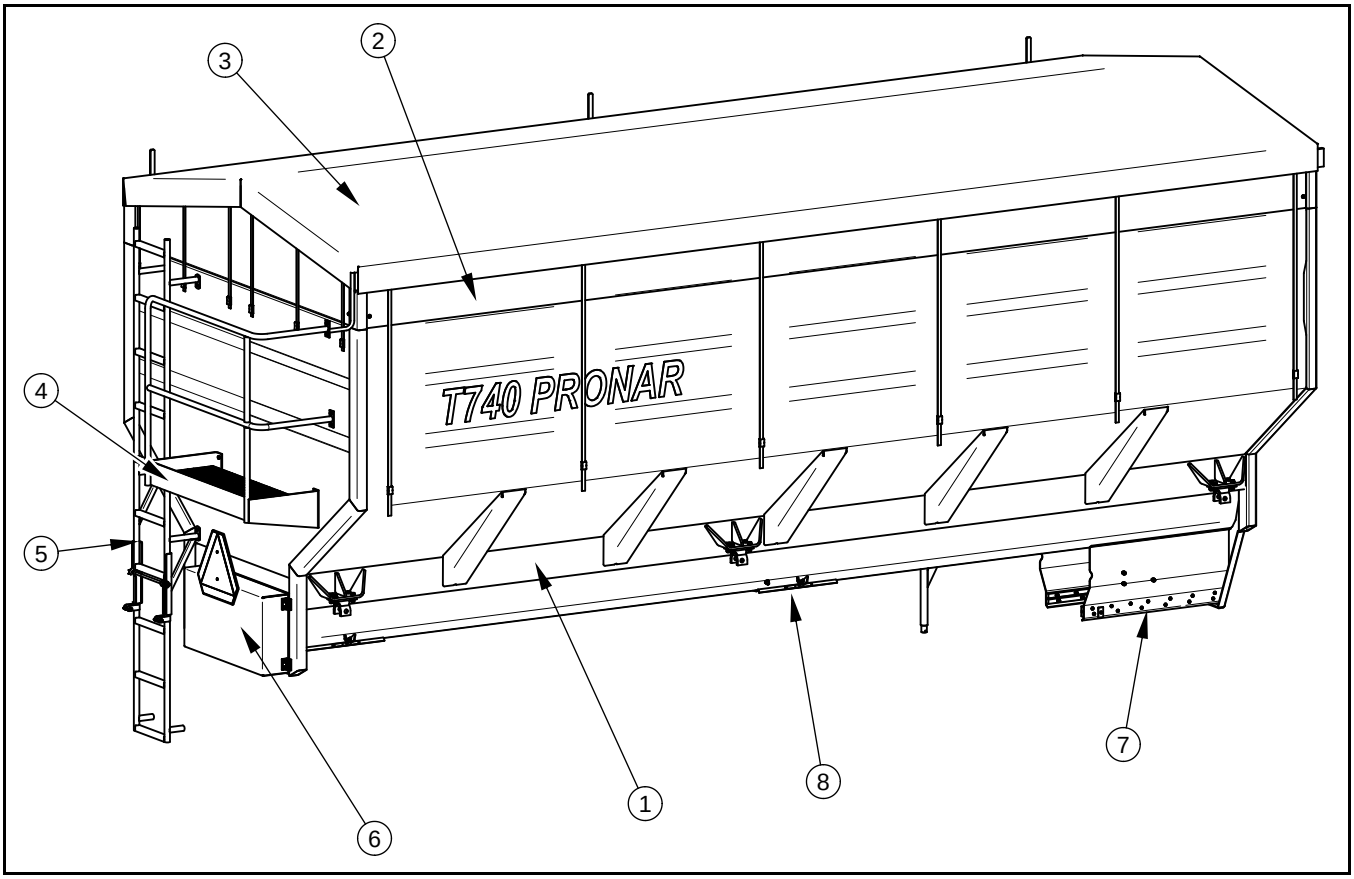


FIGURE 3.4A Load box construction

(1) load box (container), (2) height extension set, (3) cover tilt, (4) rear platform, (5) ladder, (6) rear chain gearing, (7) chute slide, (8) inspection cover

The load box is constructed as a welded construction and seated on the lower frame with the aid of weight simulators or loading link cells. On the upper part of the load box is installed a wall extension set (2) with canvas cover (3). On the rear wall of the load box is placed the platform (4) and folding ladder (5). In the lower part of the rear wall is the chain gearing (6).

In the container channel placed in the bottom of the load box are openings, which are closed with inspection covers (8) – figure (*3.4A*). in the front part is installed the chute slide (7), controlled with the aid of a hydraulic ram. Inspection covers and chute slide are designed for the complete emptying of the load remains from the container.

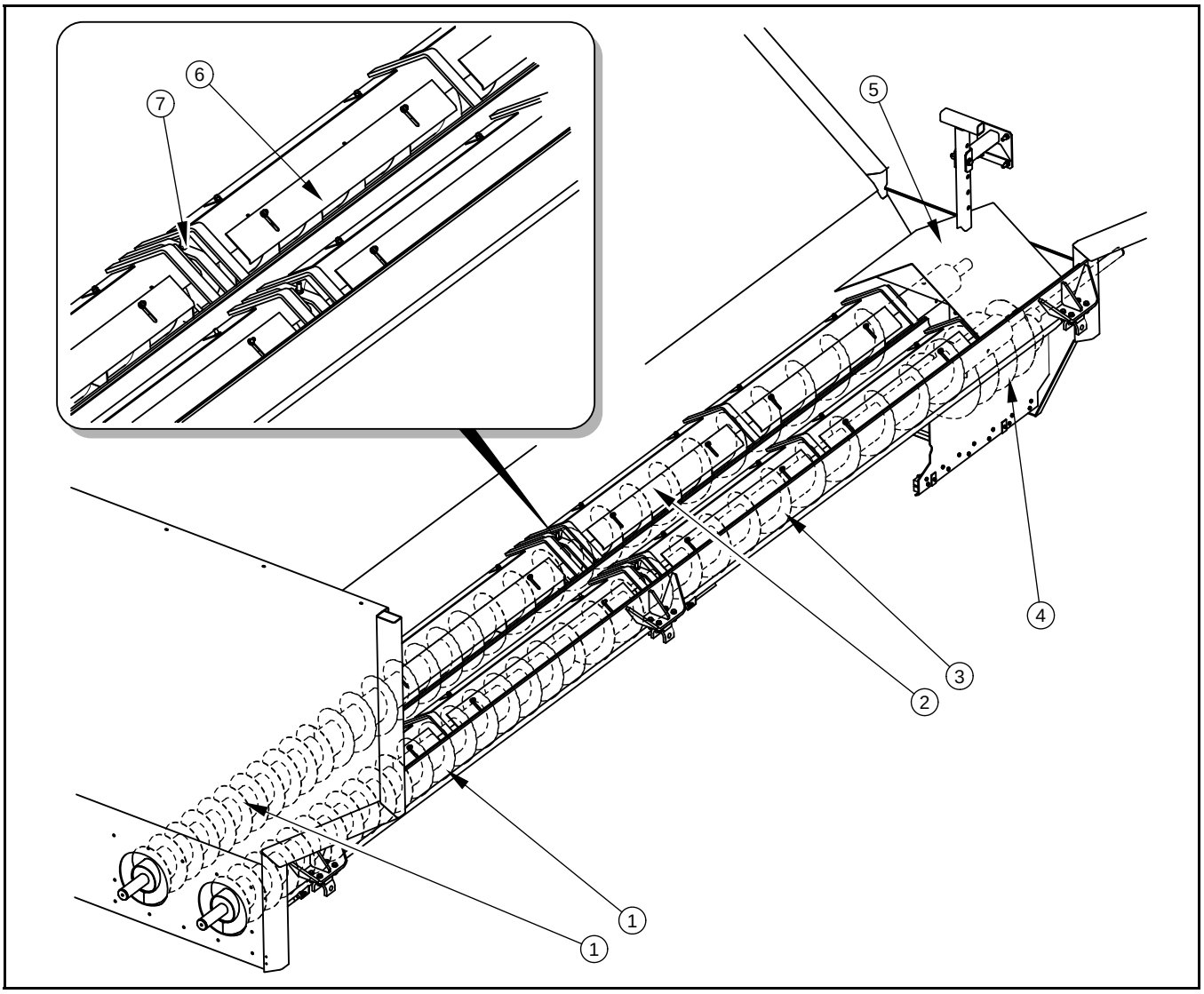


FIGURE 3.5A Load box construction

(1) auger conveyor IX (rear), (2) auger conveyor X (left front), (3) auger conveyor XI (right front), (4) auger conveyor VIII (collecting), (5) auger intake control roof, (6) channel slide cover, (7) bearing connector

On the front wall of the load box (inside container) all their intake control roof is bolted to brace (5) – figure (*3.5A*). By changing the height of the roof one regulates the speed of grain flow to the collecting auger conveyor (4), placed in the lowest part of the container (beneath roof). Remaining 4 auger conveyors are placed in two parallel channels of load box. Rear auger conveyors (1) bearings are in rear chain gearing and bearing connectors (7) in central part of load box. Auger conveyor (3), receiving torque from gearing shaft (placed on front wall of load box) is connected to auger conveyor (1) from right side of trans-shipment trailer.

Speed of inflow of grain to container channel depends on the setting of channel slides (6), placed over conveyors.

Auger conveyors transporting grain in container channels have a variable pitch, which prevents blocking during unloading and enables even transport of grain from rear part of low box to the collecting auger conveyor. Rotation speed of conveyors (1), (2) and (3) is dependent on the setting of gear wheel lever on front wall of load box.

3.4 FRONT CONVEYOR

Front conveyor is made in two basic elements: vertical conveyor (1) – figure (*3.6A*) and folding back conveyor (2). Collecting pipe (7) is directly connected to the front wall of the container. Inside the pipe is placed the collecting auger conveyor, which transfers load from load box to front conveyor. Grain is then transported by conveyors (1) and (2) the regulated discharge chute (4).

Power transmission of auger conveyors is transmitted through front chain gearing and then through intersecting axis gear placed in the lower part of the vertical conveyor pipe. After connecting PTO drive in tractor both auger conveyors begin to rotate. Gathering auger conveyor and auger conveyors placed in low box rotate after initiation of hydraulic clutch.

The upper conveyor (folded down), is raised and lowered by the age of a hydraulic ram (2) – figure (*3.7A*). After complete extension of folded down conveyor the locking bolt (6) bolts the striker tube and is clamped by spring (5). At the moment of starting the hydraulic ram (1), the striker (4) moves the bolt, folding conveyor is secured, due to which upper sub-assembly is placed in transport position.

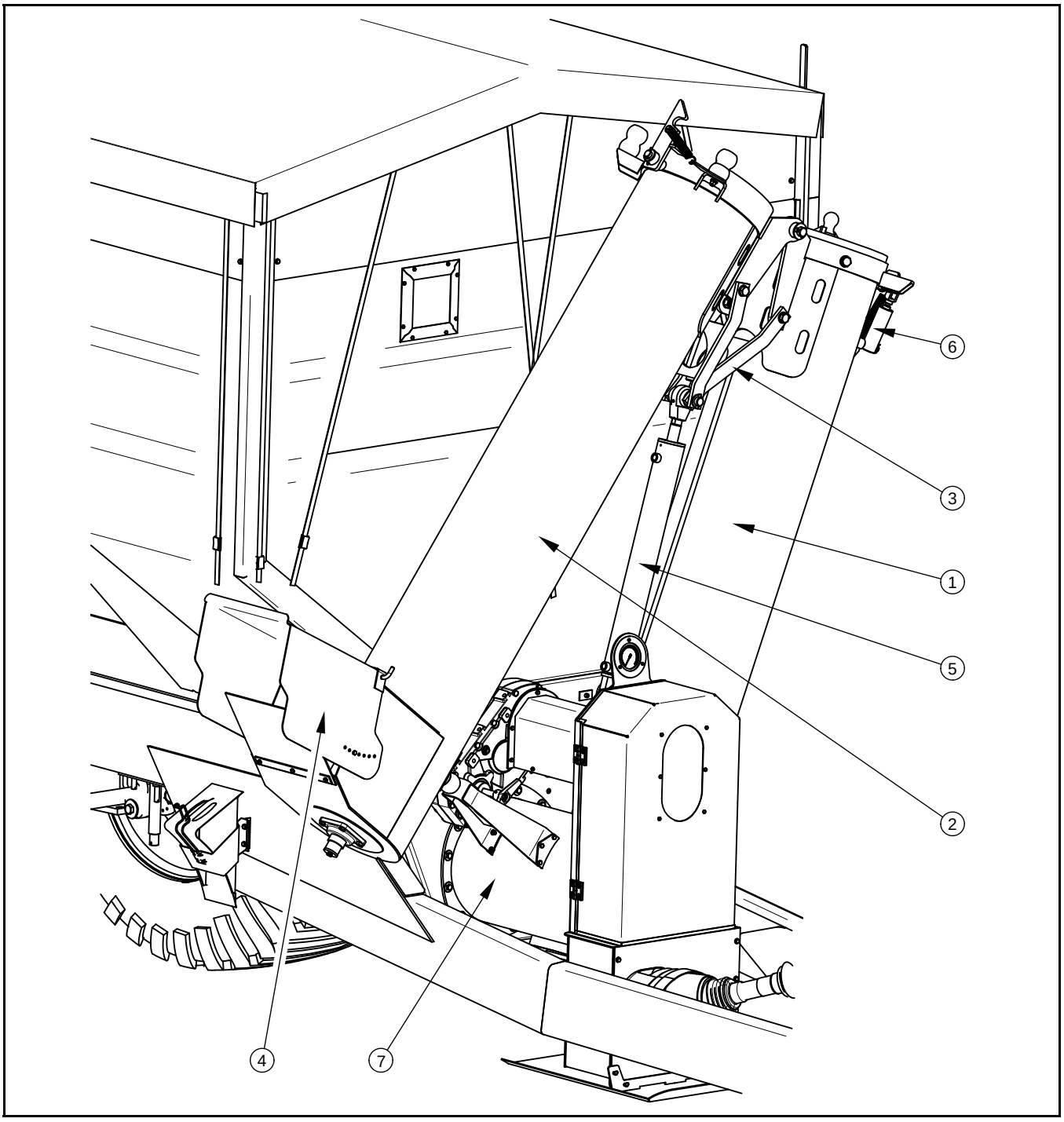


FIGURE 3.6A Front conveyor

(1) vertical conveyor, (2) folding conveyor, (3) conveyor hinge, (4) chute, (5) folding ram / unfolding conveyor, (6) ram bolting folded conveyors, (7)collection pipe

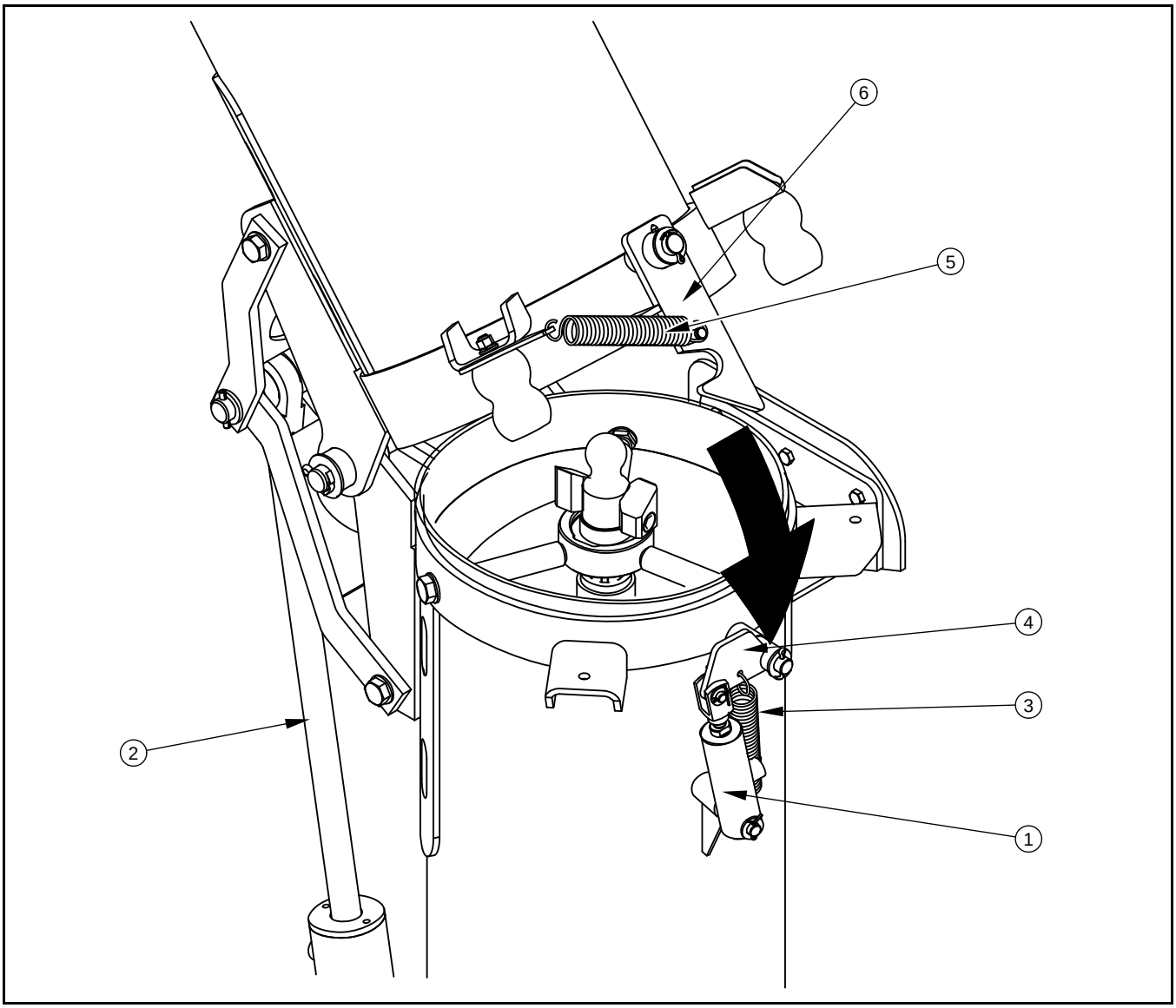


FIGURE 3.7A Bolting method

(1) ram unbolting folded conveyor, (2) ram folding/unfolding conveyor, (3) spring, (4) striker, (5) spring, (6) locking bolt

3.5 FRONT CHAIN TRANSMISSION

Front chain transmission transmits torque to the two auger conveyors placed in container and front auger conveyor. Construction of gearing is shown on figure (*3.8A*).

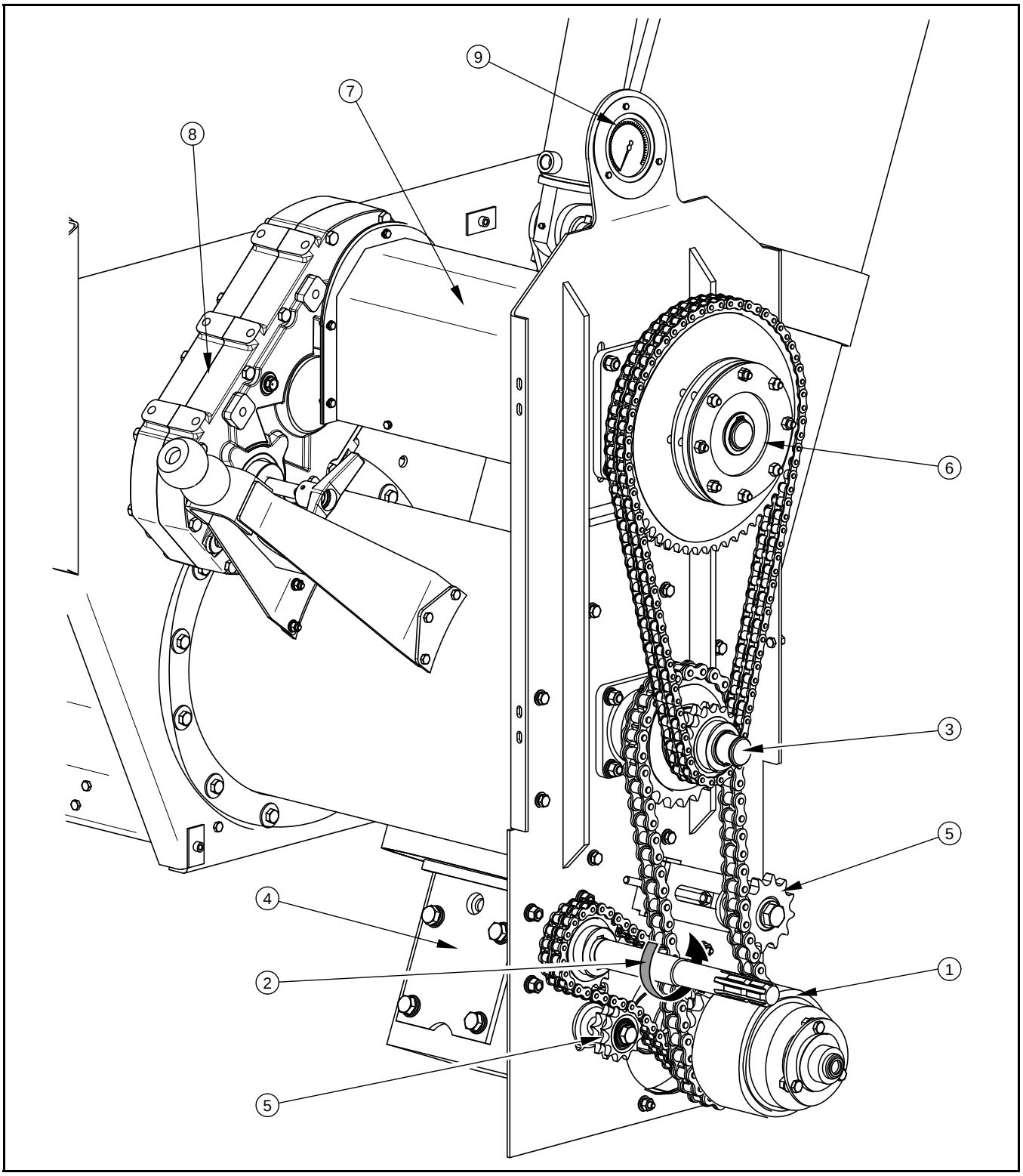


FIGURE 3.8A Front chain transmission

(1) hydraulic clutch, (2) drive shaft, (3) collecting auger conveyer shaft, (4) intersecting axis gearing, (5) toothed cog securing pin, (6) abrasive friction clutch, (7) exit shaft housing , (8) gear wheel transmission (two gears), (9) pressure gauge

Power transmission shaft (2) is connected through articulated telescopic shaft and articulated shaft to PTO shaft of tractor. After starting PTO drive only 1 gearing step operates, of which the second toothed cog is placed behind a hydraulic clutch. The torque is transmitted through intersecting axis gearing (4), which drives to auger conveyors mounted in the front conveyor.

Starting the hydraulic clutch (1) in the CH transmission of drive the following receivers - collecting auger conveyor (3) and to auger conveyors (divided) placed in container.

In upper part of gearing, on rear wall housing is placed the pressure gauge indicating actual pressure of hydraulic oil conducted to hydraulic clutch.

IMPORTANT!

Oil pressure in hydraulic clutch may not be greater than 16 bar or less than 15 bar. Too low power pressure causes slipping clutch and therefore more rapid wear of abrasive surface, too high pressure may damage clutch body.

3.6 FRONT GEAR WHEEL TRANSMISSION

Front gear wheel transmission (1) is placed on the front wall of load box. Drive is transferred to drive shaft (2) from front chain drive. Torque is directly transmitted to right front auger conveyor placed in load box.

Gear transmission is equipped with lever a enabling change of setting. In lever setting (B) high rotation is set for conveyors placed in container, position (C) reduces mechanism revolutions. Position (A) is neutral setting and may be used to remove blockages or thoroughly clean the container channel.

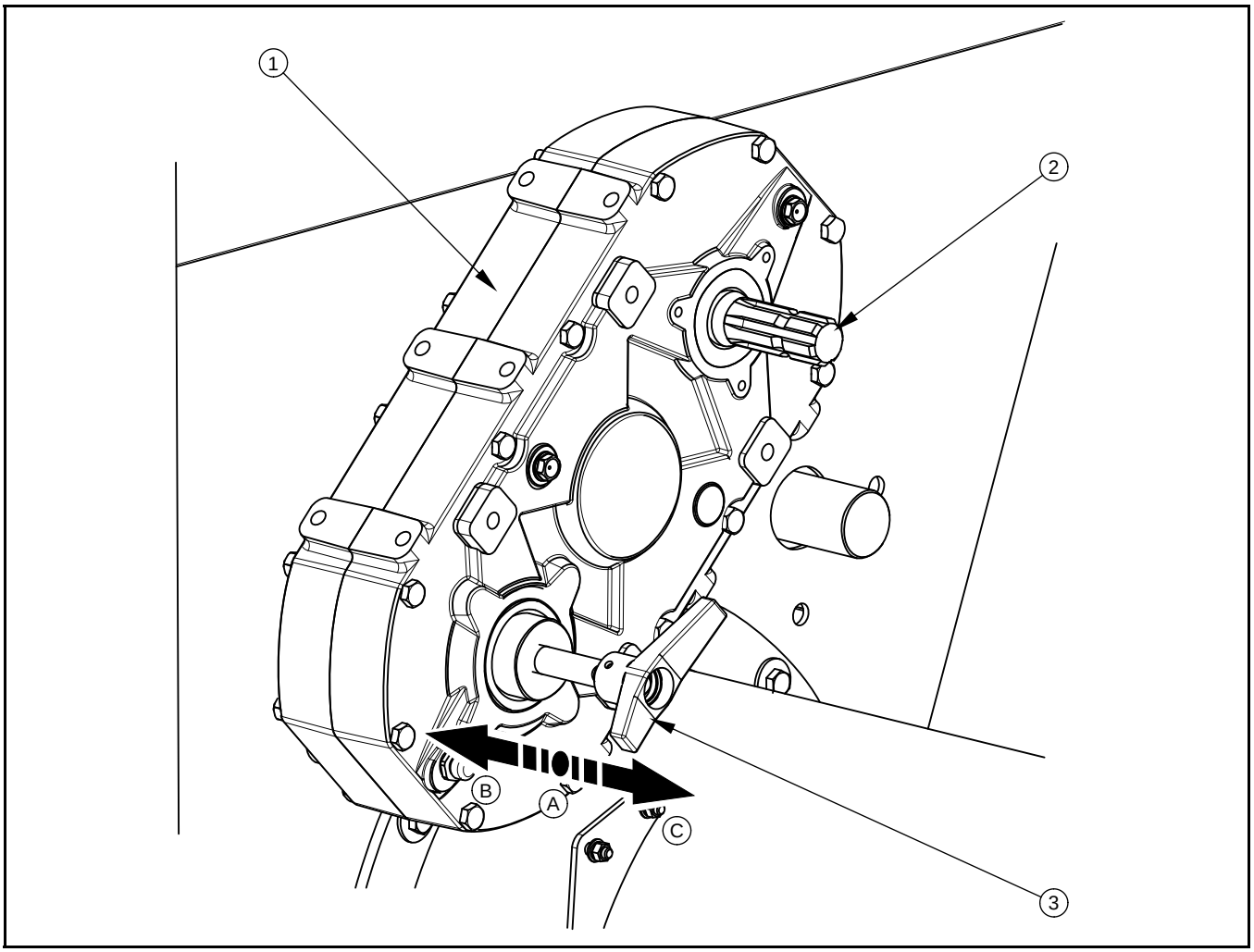


FIGURE 3.9A Front gear wheel transmission

(1) gear wheel transmission, (2) drive shaft (3) setting change lever, (A) neutral position, (B) RAPID REVOLUTIONS position, (C) SLOW REVOLUTIONS position

3.7 REAR CHAIN TRANSMISSION

Rear chain transmission is mounted on container wall. It transmits torque from auger conveyors placed in channel on the right side of the container to 2 conveyors placed on the left side of the container. Construction of gearing is shown on figure (*3.8A*).

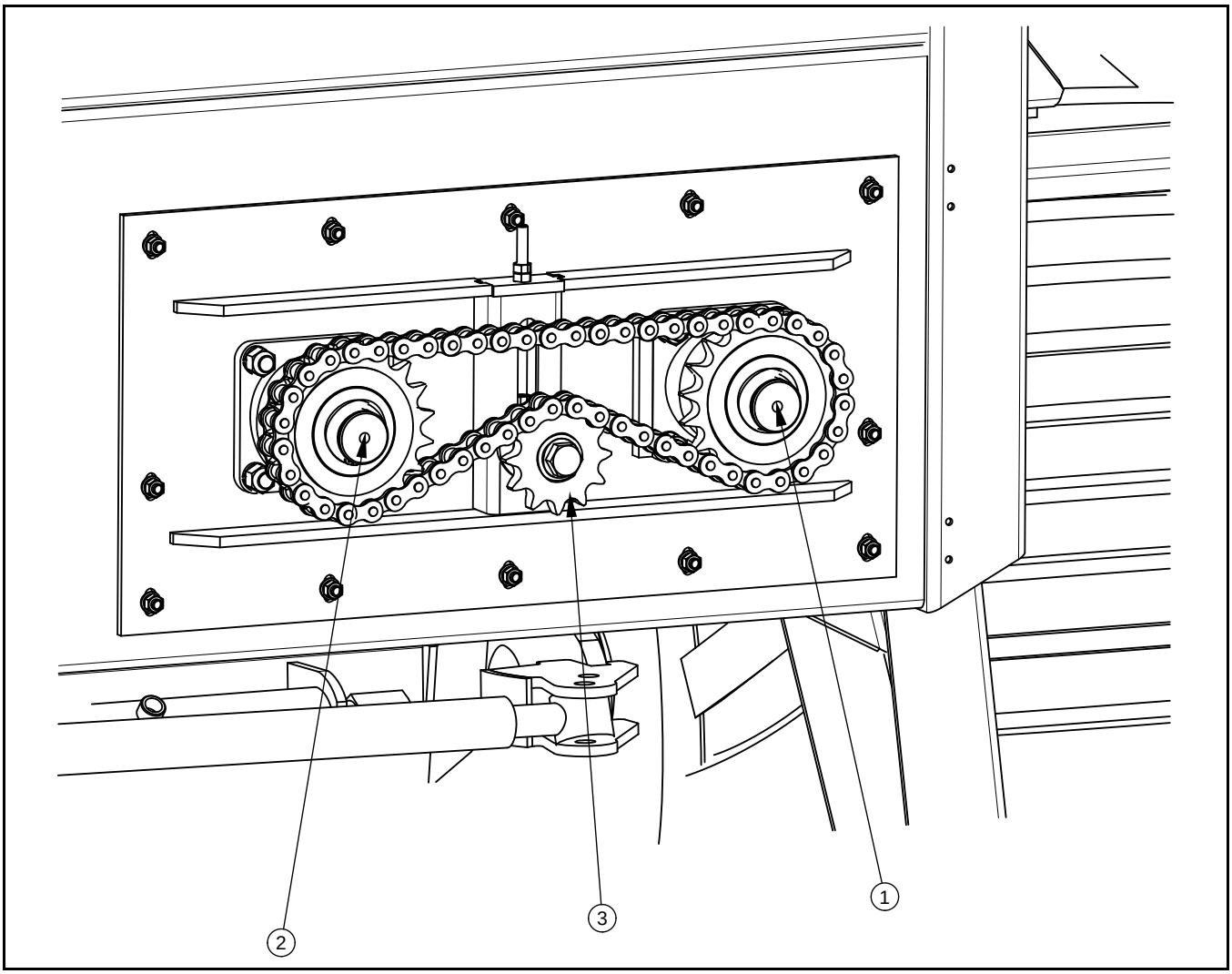


FIGURE 3.10A Rear chain transmission

(1) Rear right auger conveyer shaft, (2) rear left auger conveyer shaft, (3) tightening cog

3.8 WORKING BRAKE

The trans-shipment trailer is equipped with one of three types of working brake installations (pneumatic brakes):

- two conduit pneumatic system with three position braking force regulator - figure (*3.11A*) – standard,
- single conduit pneumatic system with three position braking force regulator - figure (*3.12A*)
- two conduit pneumatic system with automatic braking force regulator - figure (*3.13A*)

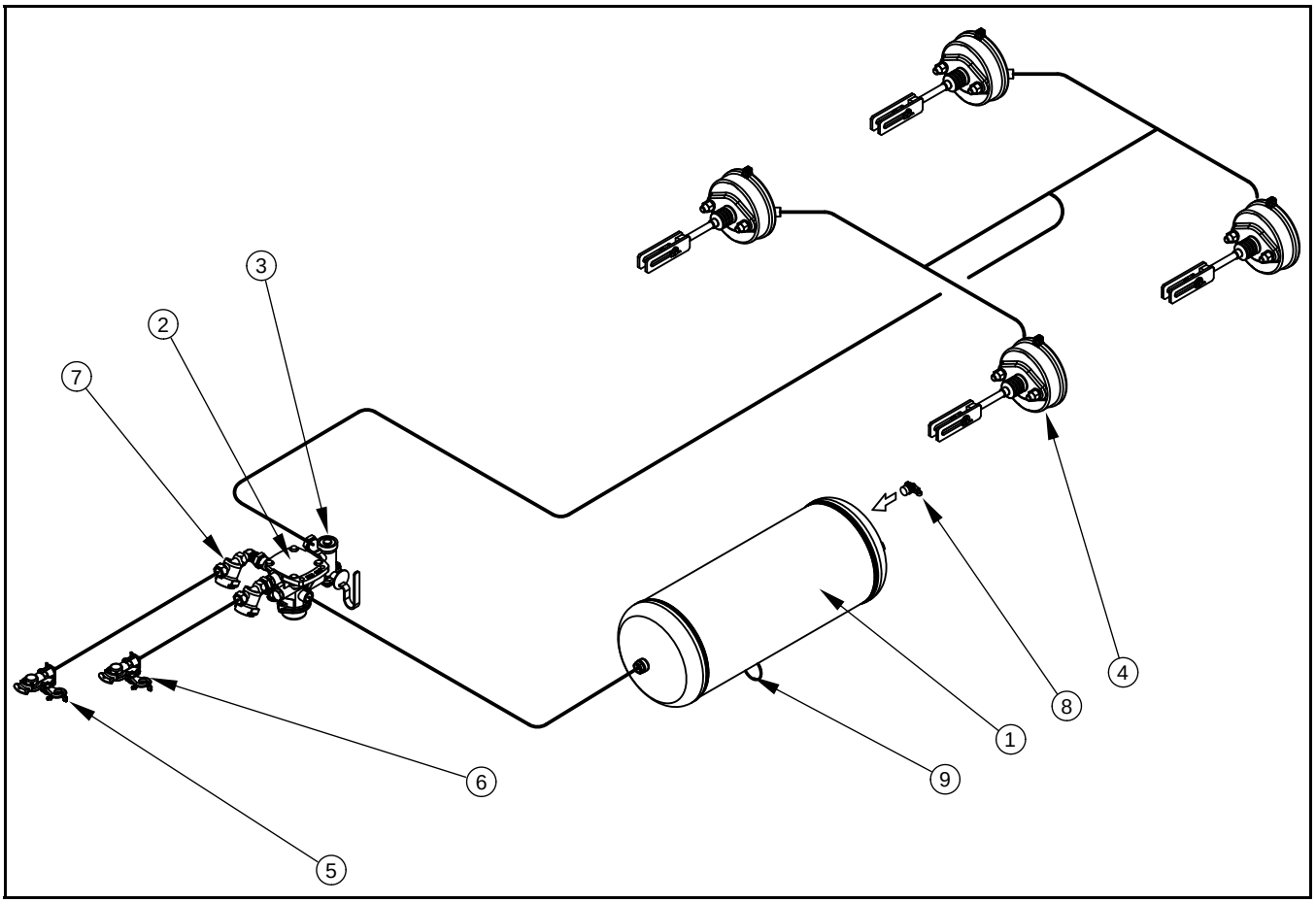


FIGURE 3.11A Two conduit pneumatic system diagram with three position regulator

(1) air tank, (2) control valve, (3) brake force regulator, (4) pneumatic ram, (5), (6) lead connectors, (7) air filter, (8) air tank control connectors (9) drain valve

Working brake is activated from the tractor driver's cab by pressing on the brake pedal in the tractor. The function of the control valve (2), applied in pneumatic systems - figure (3.7A), is the operation of the trans-shipment trailer brakes simultaneously when tractor's brakes are applied Furthermore, in case of an inadvertent disconnection of the conduit between the trailer and the tractor, the control valve will automatically activate trailer's brakes. Valve used in the system is equipped with a brake to be applied when trailer is disconnected from the tractor. When compressed air conduit is connected to a tractor, the device automatically applying the brakes now changes its position to allow normal brake operation.

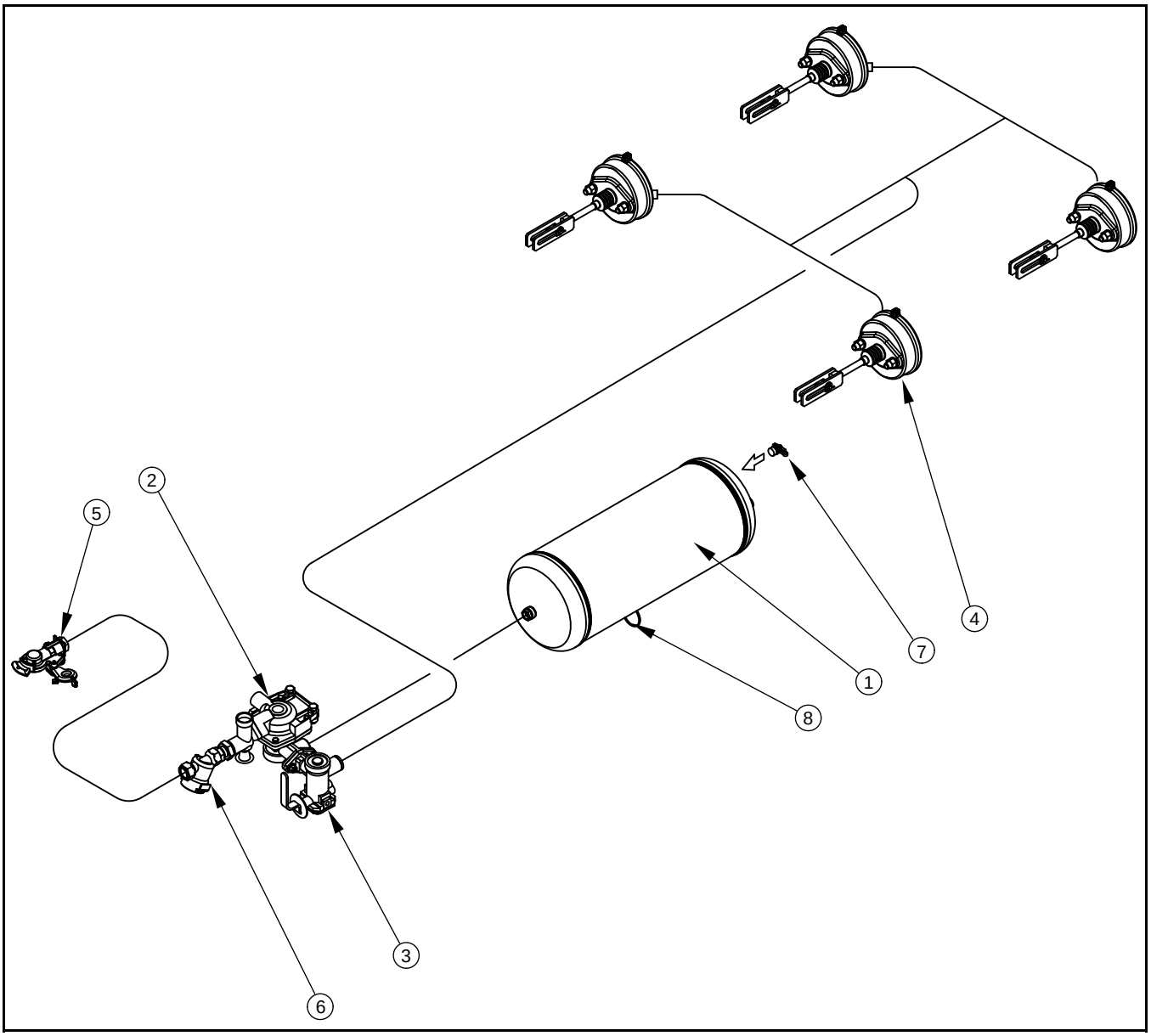


FIGURE 3.12A Single conduit pneumatic system diagram with three position regulator

(1) air tank, (2) control valve, (3) brake force regulator, (4) pneumatic ram, (5), (6) lead connectors, (6) air filter, (7) air tank control connectors (8) drain valve

Brake pneumatic cylinders applied in the systems are mounted on specially prepared brackets welded to the axle. They are membrane cylinders. Air supplied to cylinder exerts pressure on membrane which in turn moves cylinder piston and rotates to axle expander lever. Return of cylinder to neutral position is assisted by draw back springs.

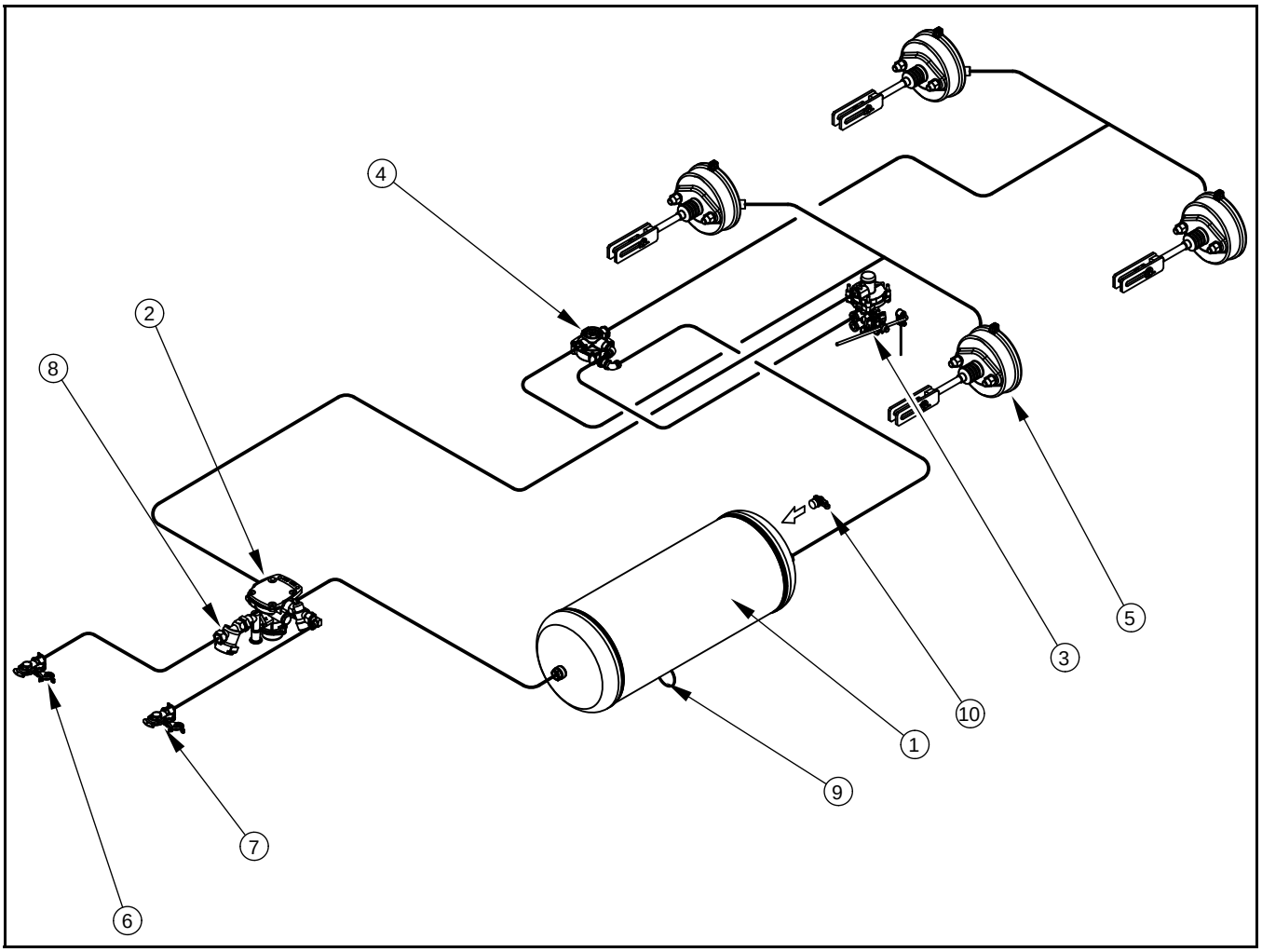


FIGURE 3.13A Two conduit pneumatic system diagram with an automatic regulator

(1) air tank, (2) control valve, (3) automatic brake force regulator, (4) transmission valve, (5) pneumatic cylinder, (6), (7) lead connectors, (8) air filter, (9) drain valve (10) air tank control connectors

In two conduit braking system, with automatic braking force regulator, an additional transmission valve is mounted (4), the function of which is to significantly increase the speed of transmission to cylinders during the breaking process.

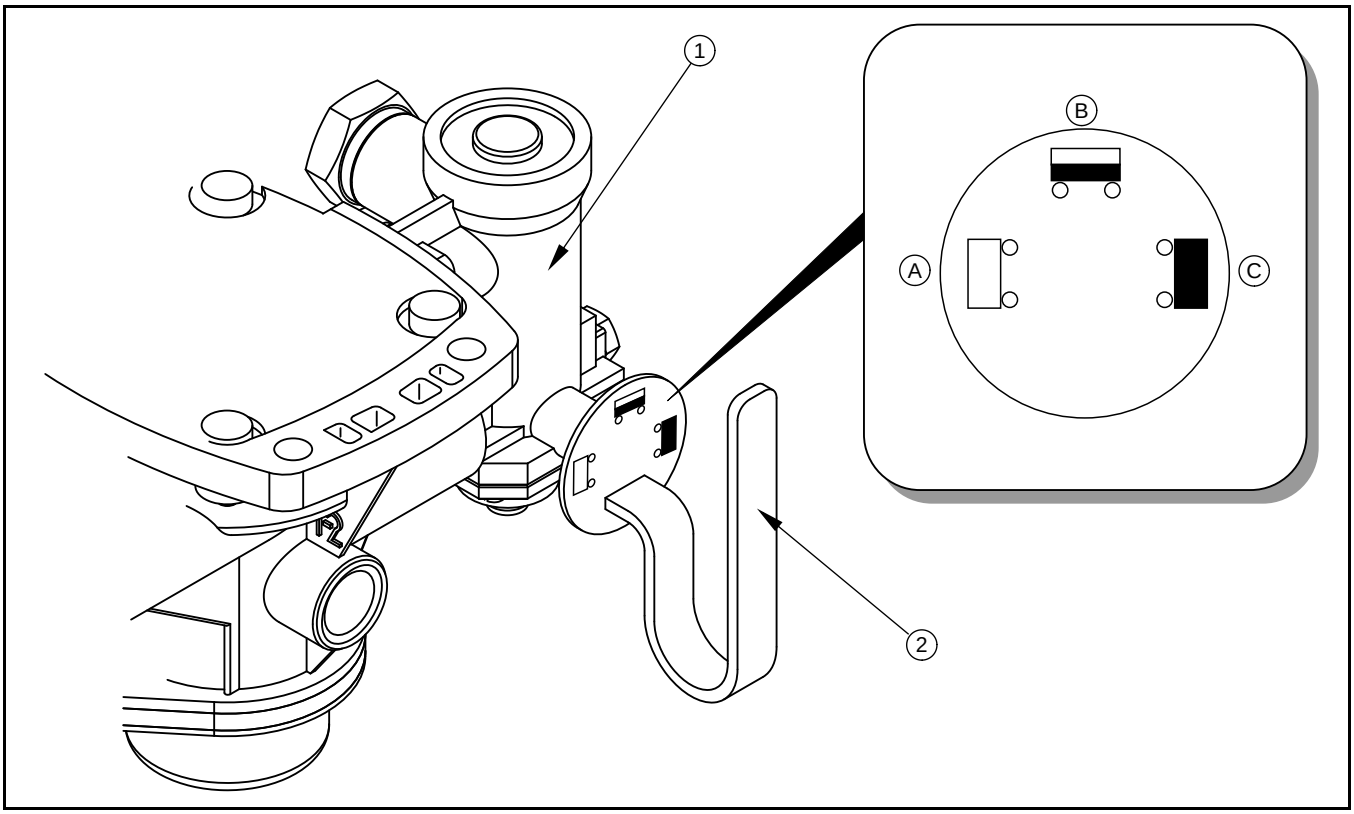


FIGURE 3.14A Three position manual regulator

(1) three-step brake force regulator, (2) regulator setting control lever, (A), (B), (C) regulator operation position

Three-step brake force regulator - figure (*3.9A*), applied in pneumatic systems adjusts braking force depending on setting. Switching to a suitable working mode is done manually by machine operator with the aid of the lever (2) prior to moving off. Three working positions are available: A - "no load", B - "half load" and C - "full load".

Automatic braking force regulator adapts braking pressure depending on the load of the trans-shipment trailer. During normal work it does not require service.

Depending on braking system version installed in trans-shipment trailer, the system is equipped with either one or two pneumatic conduits. They are marked with coloured safety covers, which enable identification of individual connections:

- colour black – single conduit pneumatic installation,
- colour red – two conduit pneumatic installation, supply connection,
- colour yellow - two conduit pneumatic installation, control connection.

Additionally, each pneumatic connection is equipped with a cut-off valve, which automatically cuts off outflow of pneumatic conduit in the event of disconnection from agricultural tractor socket.

3.9 PARKING BRAKE

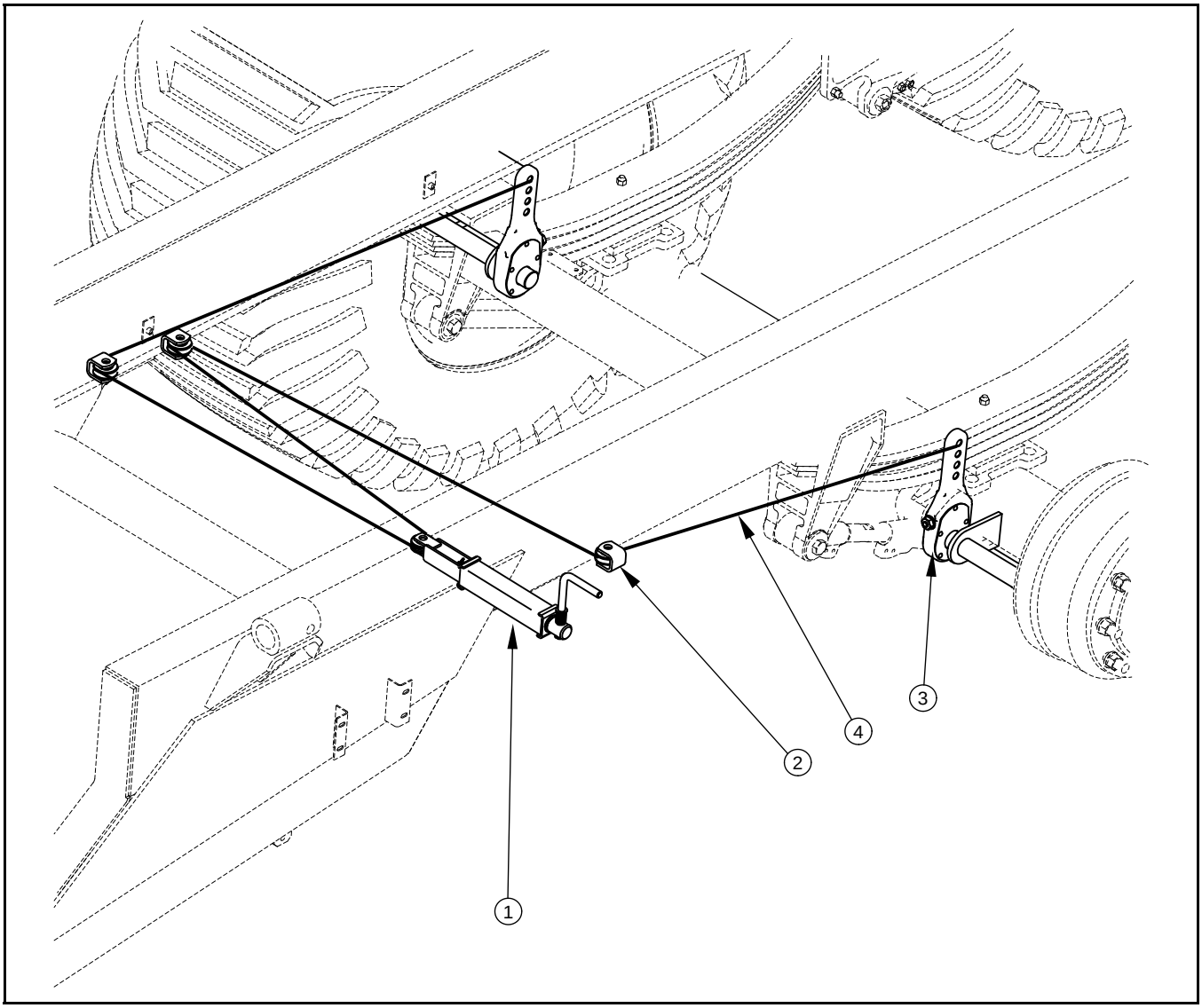


FIGURE 3.15A Parking brake

(1) parking brake crank mechanism, (2) handle with wheel, (3) axle expander lever, (4) steel cable

The parking brake is for immobilising trans-shipment trailer while standing motionless. The brake crank mechanism (1) is mounted on the left longitudinal of the lower frame. Steel cable (4) is connected to axle expander lever (3) with crank mechanism. Tightening the cable

causes tilting of the expander lever, which parts the jaws of the brake shoes immobilising the trans-shipment trailer.

3.10 TURNING INTERLOCK HYDRAULIC SYSTEM

Trans-shipment trailer as standard equipment in passively steered turning rear axle. Axle design enables easier cornering and easier manoeuvring on marshy terrain, due to which there is less tyre wear on machine. While reversing, axle hub must be blocked, otherwise the trans-shipment trailer will have a tendency to turn uncontrollably to the left or the right during reversing.

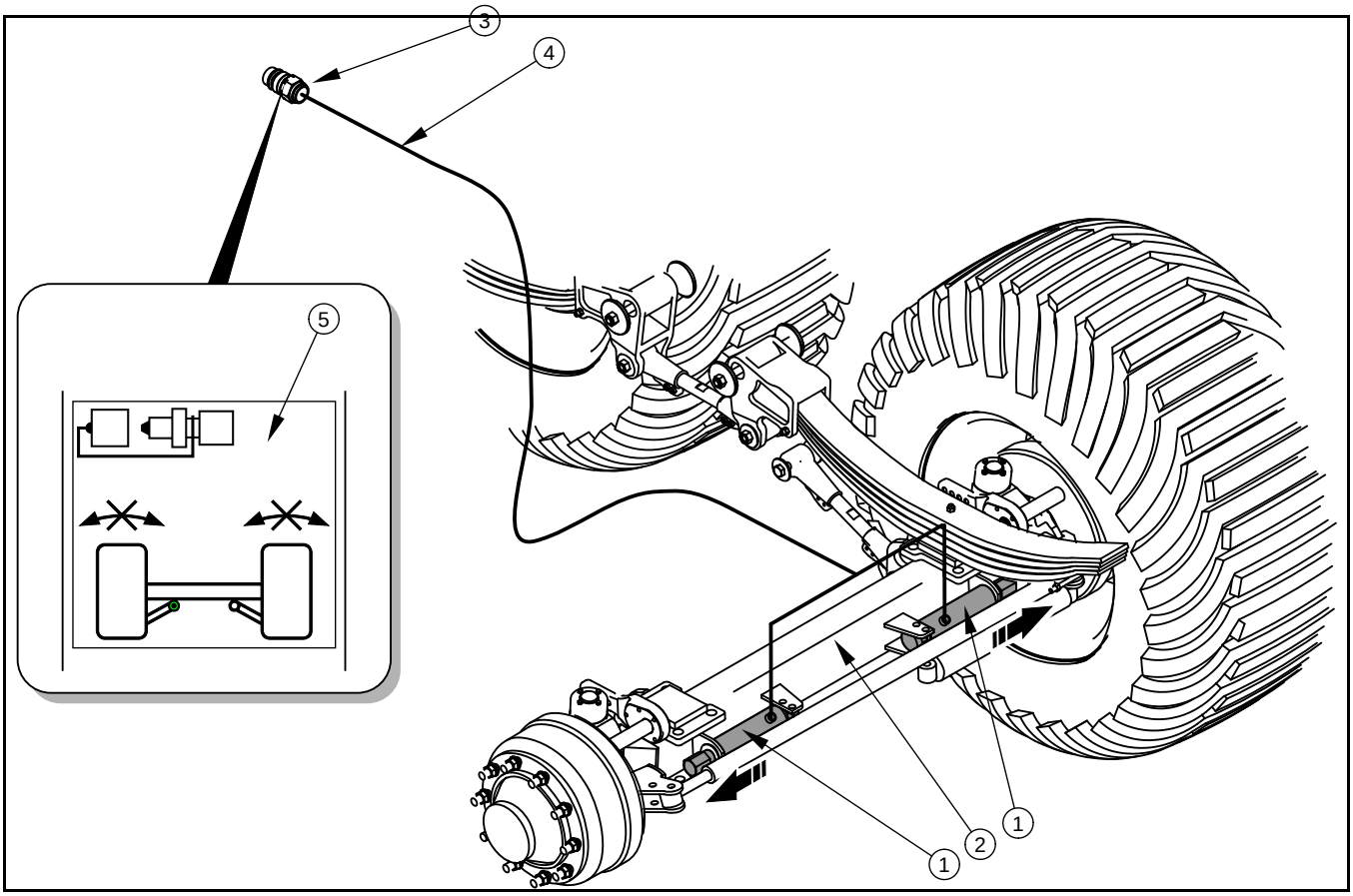


FIGURE 3.16A Rear axle hydraulic interlock system

(1) turning interlock cylinder, (2) rear turning axle, (3) hydraulic quick couplers, (4) hydraulic conduit, (5) information sticker

Axle interlock is enabled by single conduit hydraulic system shown on figure (*3.16A*). Before moving to the rear extend hydraulic turning interlock cylinder (1) with the aid of tractor manifold lever.

Turning interlock system hydraulic connections are marked with blue coloured stoppers, as stated by sticker (5).

3.11 HYDRAULIC SYSTEM SLIDE BOLT AND CONVEYOR

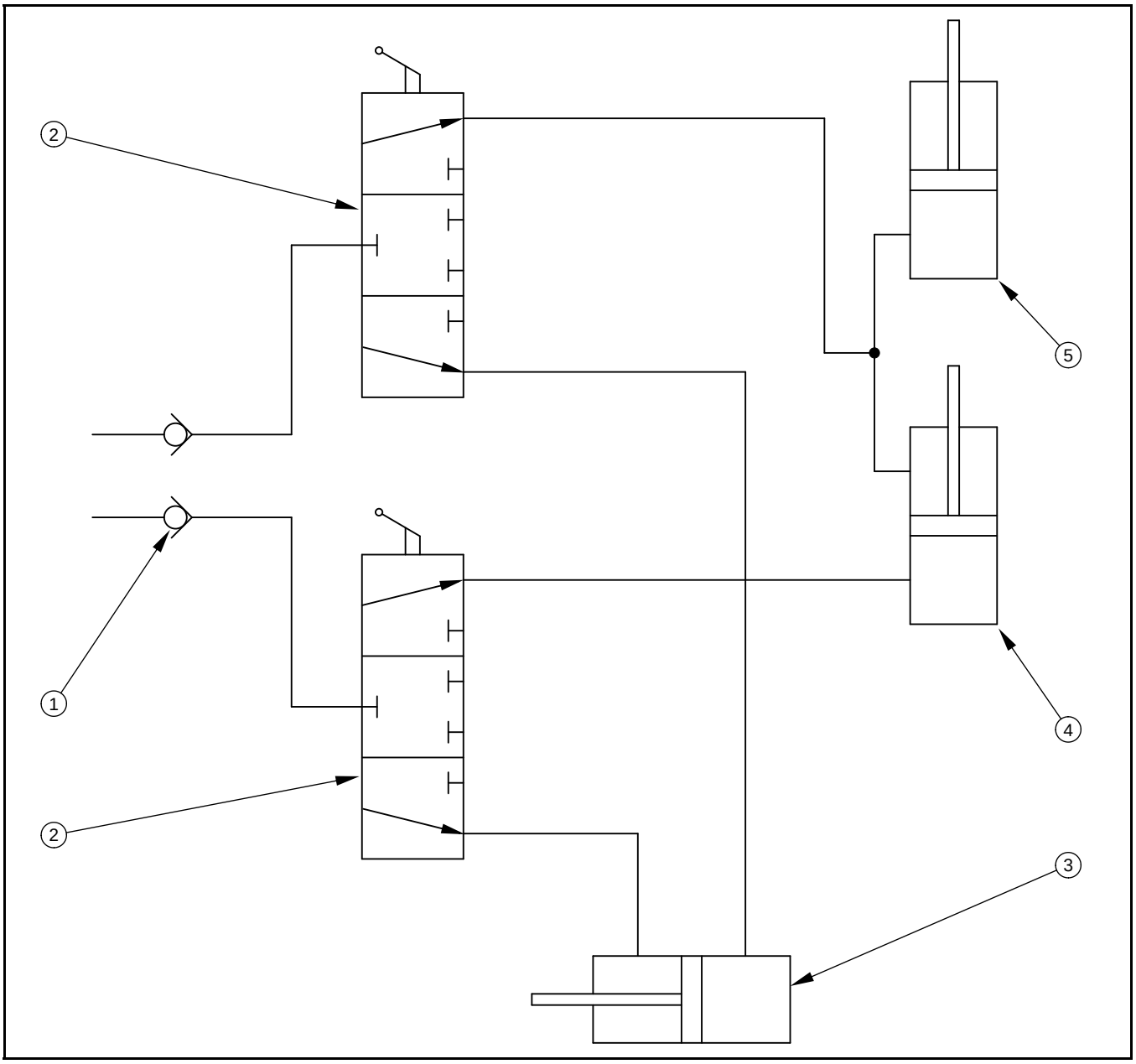


FIGURE 3.17A Slide bolt and conveyor hydraulic system concept diagram

(1) quick couplers, (2) hydraulic valve, (3) slide bolt cylinder, (4) folded conveyor raising cylinder, (5) folded conveyor bolting cylinder

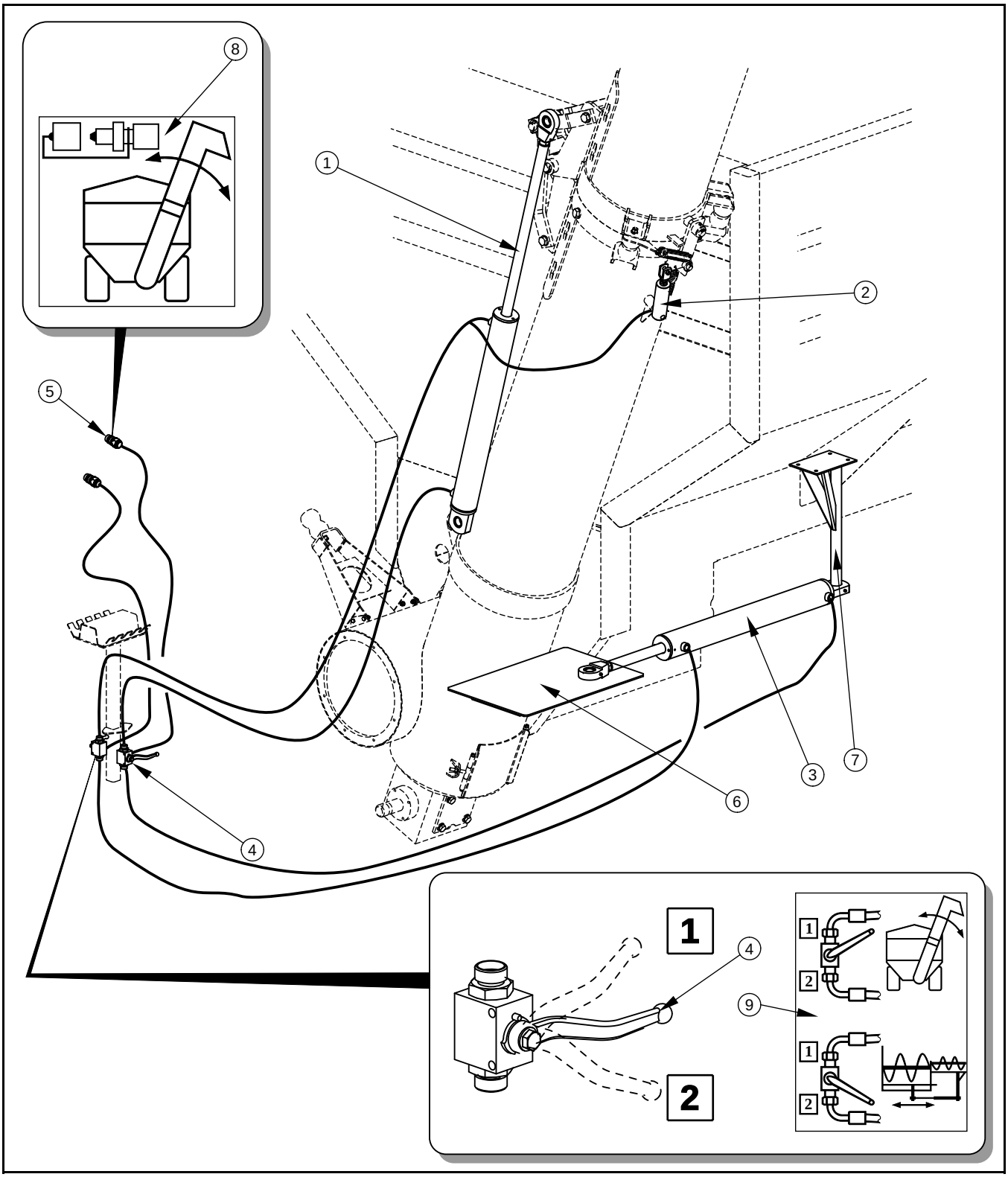


FIGURE 3.18A Placing of elements of hydraulic slide bolt and conveyor installation

(1) folded conveyor raising cylinder, (2) folded conveyor bolting cylinder, (3) locking bolt cylinder, (4) hydraulic valve, (5) quick couplers, (6) slide bolt, (7) cylinder bracket, (8), (9) information sticker

System design and concept diagram are presented on figures (*3.17A*) and (*3.18A*). Hydraulic slide bolt and conveyor system fulfil the following function in trans-shipment trailer:

- raising / lowering folded conveyor,
- locking / unlocking folded conveyor,
- opening / closing container channels slide.

Connecting individual circuits for work takes place manually by the machine operator with the aid of hydraulic valves (4) – figure (*3.18A*), placed on bracket. Valve set in position **1** directs hydraulic oil stream to cylinders (1) and (2). In the event of setting valves in position **2**, oil is directed to circuit controlling slide cylinder. In central position, the supply of hydraulic oil to system is cut off.

IMPORTANT!

Remember the setting of both valves simultaneously during work.

The channel slide may be used for unloading grain to the chutes placed under the floor or for through cleaning of container channel of load remnants.

Hydraulic system quick couplers are marked with the aid of red stoppers, as stated on information sticker (8). Working positions of valves are marked on information sticker (9).

3.12 HYDRAULIC CLUTCH SYSTEM

Hydraulic clutch system is designed for remote starting of trans-shipment trailer container auger conveyor drive. Position of system elements is shown in figure (*3.19A*).

With regard for the significant differences in the design of agricultural tractors (supply pressure from hydraulic distributor), conduct reduction valve regulation after connection to tractor. If not, the hydraulic clutch may be damaged.

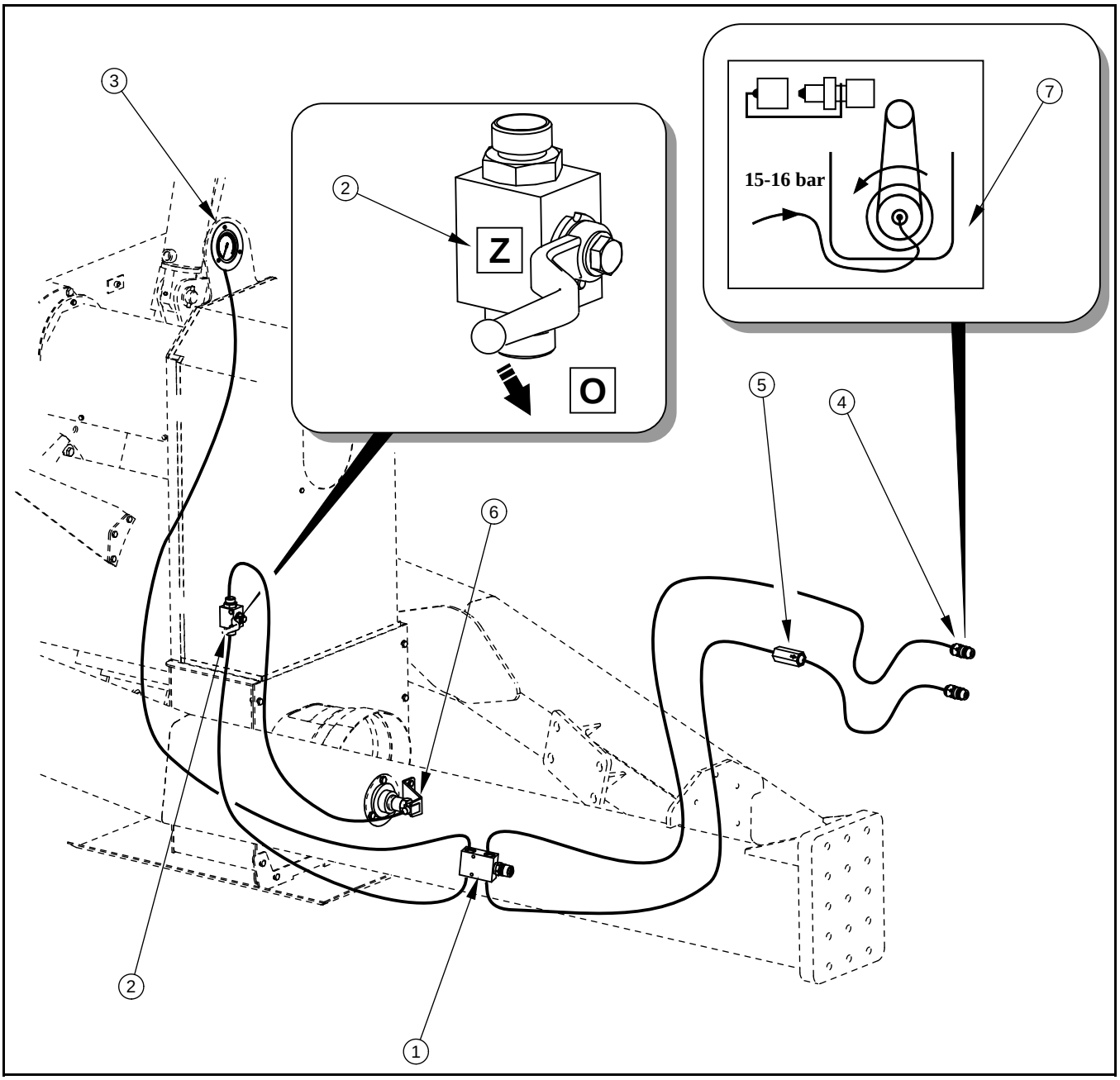


FIGURE 3.19A Position of hydraulic clutch system elements

(1) reduction valve connection plate, (2) hydraulic valve, (3) pressure gauge, (4) quick couplers, (5) return valve, (6) rotary connection, (7) information sticker

IMPORTANT!

After connecting agricultural tractor trans-shipment trailer regulate the reduction valve (1) – figure (3.19A).

TIP

Hydraulic oil pressure range for starting clutch is 15-16 bar.

Cut-off valve (2) is designed for cutting off hydraulic oil in flow to clutch during working pressure regulation of system. In the course of normal use it must be set in open position.

Quick coupler terminals are marked with black coloured stoppers, as stated on information sticker (7). Cut-off valve position (2) is marked with the aid of sticker „O", „Z" (**O**-Open/**Z-Closed**).

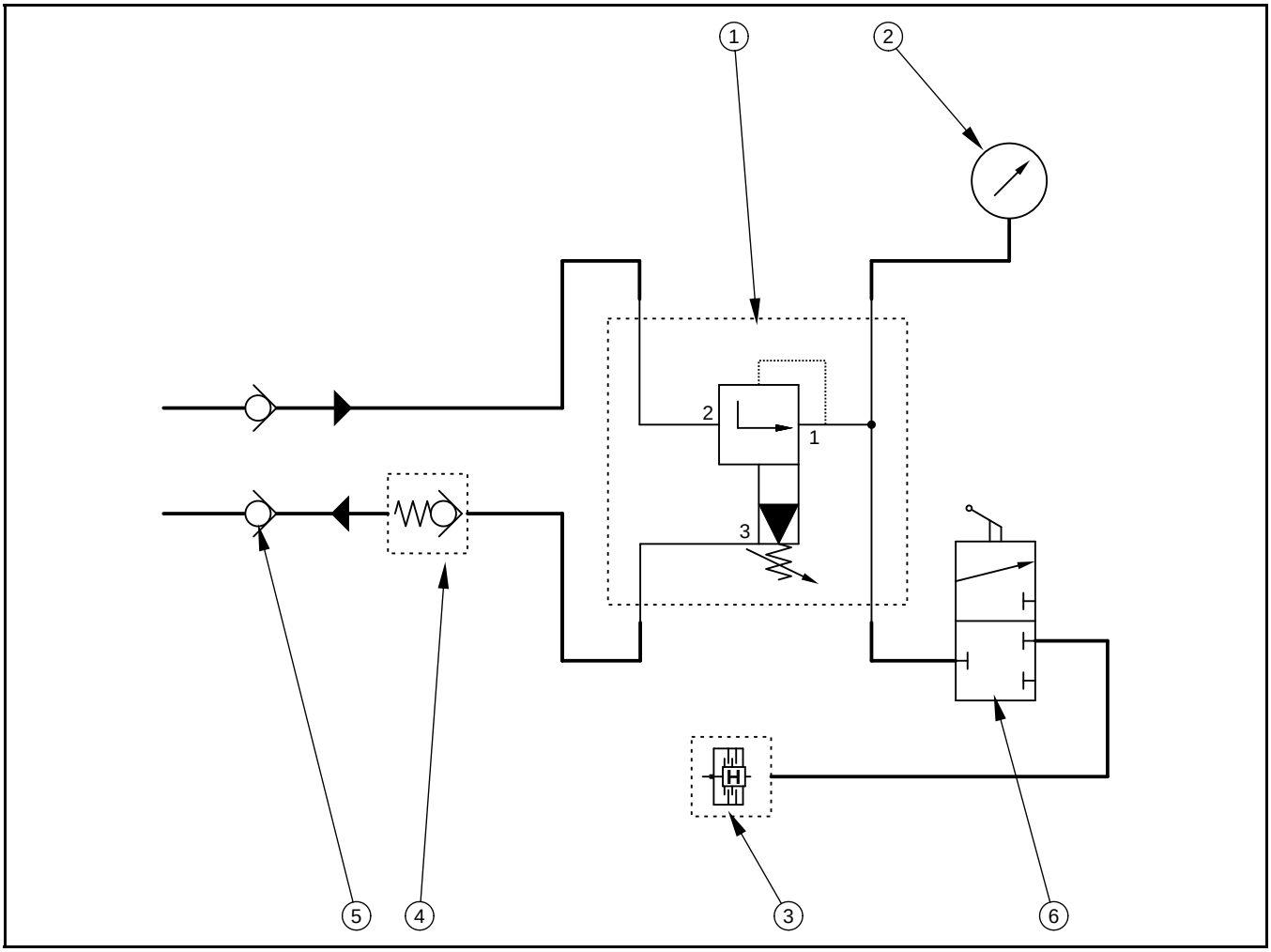


FIGURE 3.20A Hydraulic clutch system concept diagram

(1) reduction valve connection plate panel, (2) pressure gauge, (3) hydraulic clutch, (4) return valve, (5) quick couplers, (6) hydraulic valve

3.13 ELECTRIC LIGHTING SYSTEM

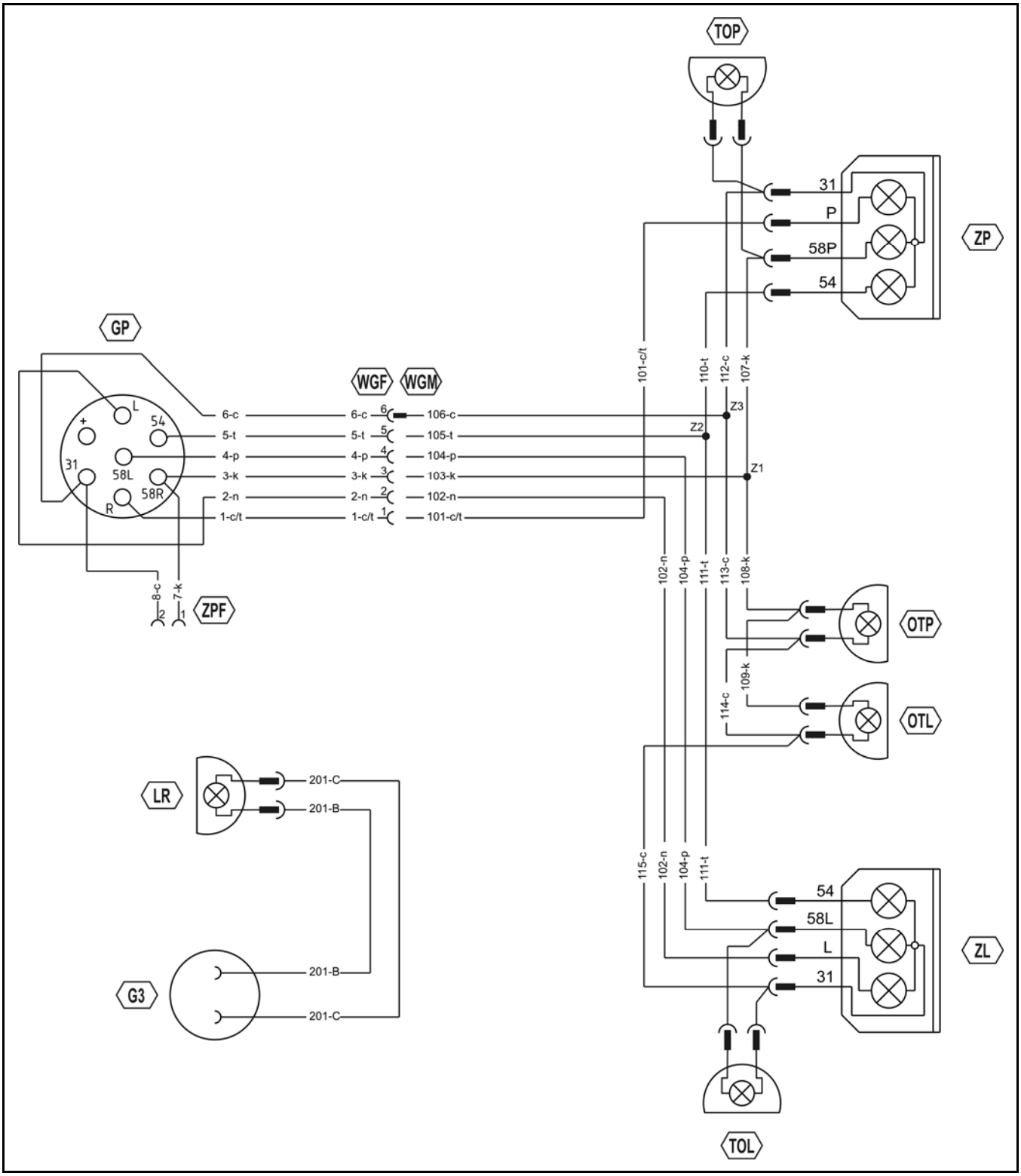


FIGURE 3.21A Electric lighting system diagram

Description of markings in table (3.2)

TABLE 3.2 LIST OF MARKINGS APPLIED ON FIGURE (3.21A)

SYMBOL	FUNCTION
ZP	Rear right light combination group
ZL	Rear left light combination group
GP	Front seven pin socket
G3	3-pin plug
WZ	Cigarette lighter supply plug
TOP	Rear right clearance light
TOL	Rear left clearance light
OTP	Right registration plate light
OTL	Left registration plate light
LR	Working light

Trans-shipment trailer electric lighting system is adapted to supply from direct current source of 12 V. Connection of the vehicle's electrical system with the tractor should be made through an appropriate connection lead that is part of the trailer's standard equipment.

TABLE 3.3 MARKING OF CONNECTIONS

MARKING	FUNCTION
31	Weight
+	Power supply +12V (not used)
L	Left indicator
54	STOP light
58L	Rear left parking light
58R	Rear right parking light
R	Right indicator

TABLE 3.4 CONDUIT COLOUR MARKING

MARKING	CONDUIT COLOUR	MARKING	CONDUIT COLOUR
B	White	O	Brown
C	Black	P	Orange
F	Violet	R	Pink
K	Red	S	Grey
L	Lazurite	T	Green
N	Blue	Z	Yellow

Working lamp placed on vertical conveyor is supplied from 12V DC socket mounted on rear of tractor.

3.14 ELECTRIC WEIGHING SYSTEM INSTALLATION

Trans-shipment trailer may be equipped with transported load weighing system. The system applied is composed of six loading link cells placed on lower frame mounting brackets. Trans-shipment trailer load box is placed on them. If the machine is not equipped with weighing system, load cells are replaced with weight simulators.

Load cells are connected through connection box with electronic display, which analyses electric signals originating from weighing points and calculating load weight.

IMPORTANT!

Welding electric elements may damage load cells, therefore before commencing this type of work remove these elements.

Weighing system concept diagram is shown in figure (*3.22A*).

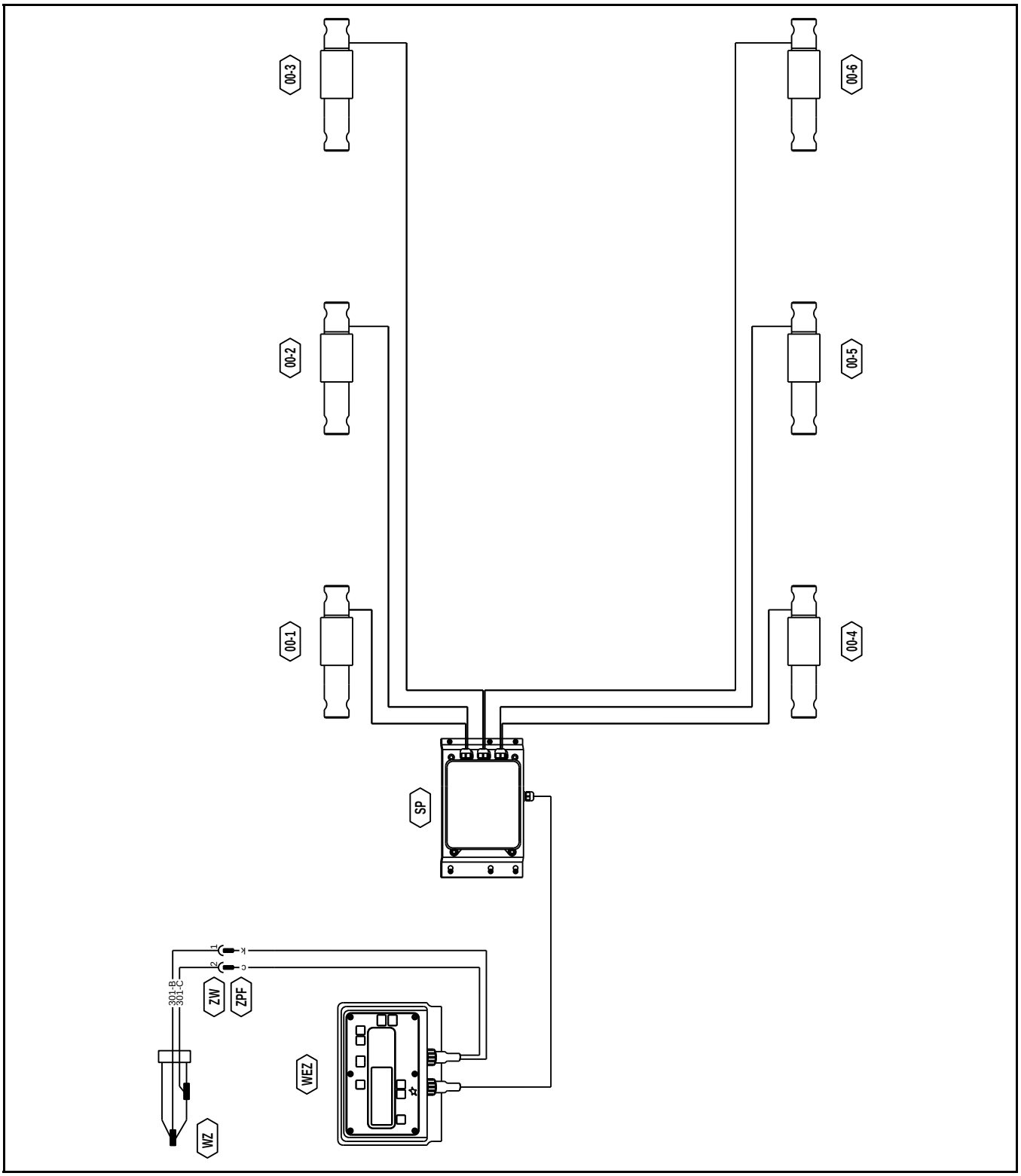


FIGURE 3.22A Lighting panel

Description of markings on table (3.5)

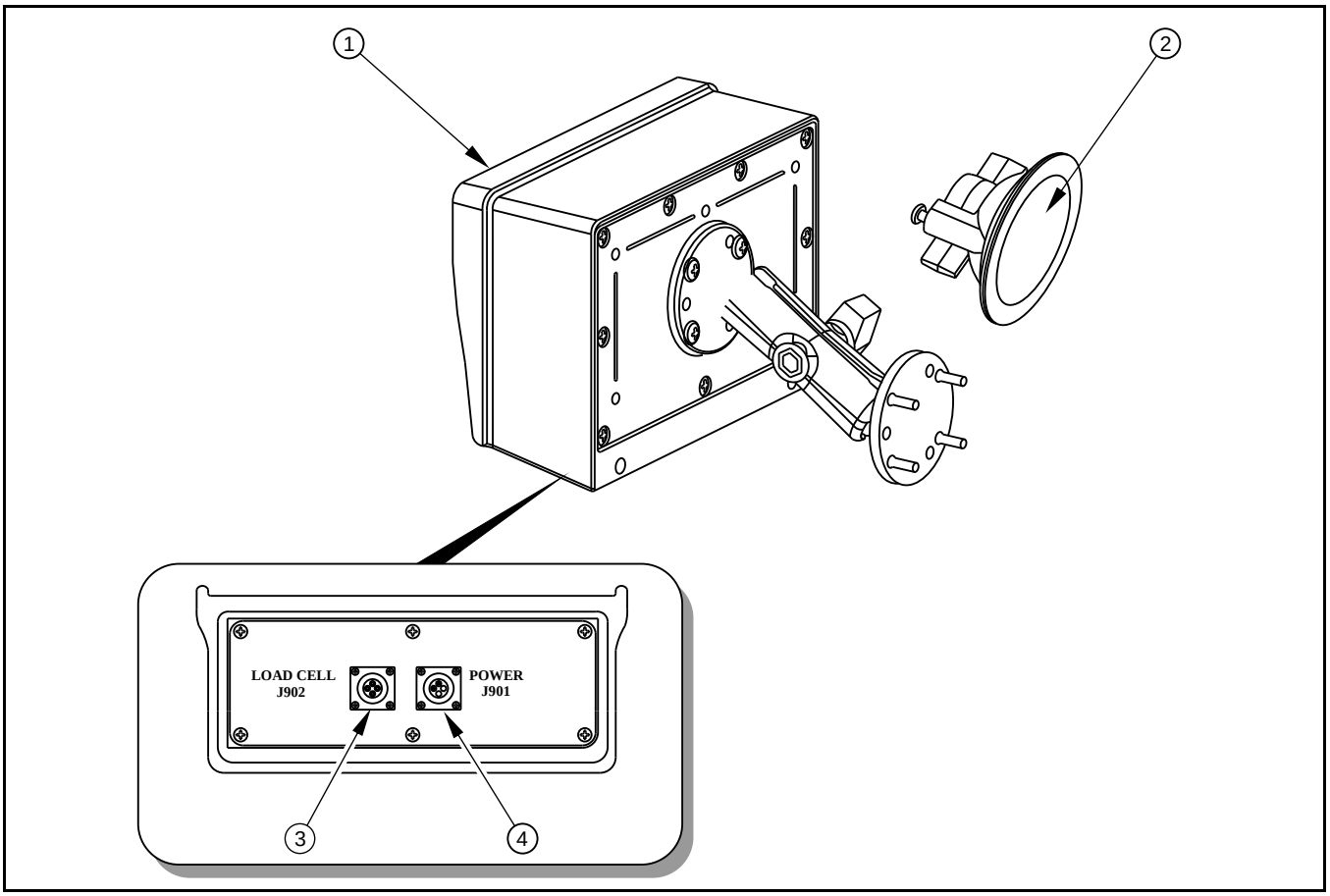


FIGURE 3.23A Weighing system diagram

(1) counter, (2) rubber vacuum cup, (3) load cell connection socket, (4) power supply socket

Counter (1) is mounted in tractor operator cab on bracket with rubber suction pad. Power supply to counter and whole weighing system is through connection conduit connected with the lighter socket in the tractor.

TABLE 3.5 LIST OF MARKINGS APPLIED ON FIGURE (3.21A)

SYMBOL	FUNCTION
WZ	Cigarette lighter supply plug
WEZ	Electronic display EZ 400
SP	Connection box
OO-1 …OO-6	Load cells

SECTION

4 CORRECT USE

PREPARING FOR WORK BEFORE FIRST USE
ATTACHING TO TRACTOR
TRANS-SHIPMENT TRAILER SUPPORT OPERATION
LOADING
SECURING LOAD
TRAILER TRANSPORT
UNLOADING
DISCONNECTING FROM TRACTOR
PROPER USE AND MAINTENANCE OF TYRES
WEIGHER OPERATION

4.1 PREPARING FOR WORK BEFORE FIRST USE

The manufacturer guarantees that the trans-shipment trailer is fully operational and has been checked according to quality control procedures and is ready for normal use. This does not release the user from an obligation to check the machine's condition after delivery and before first use. The machine is delivered to the user in a completely assembled state.

Before commencing work, machine operator must inspect the technical condition of the trans-shipment trailer and prepare it for test start-up. The user must familiarise himself with the content of these instructions and additional publications attached to machine, observe all recommendations, understand the design and the principle of machine operation

IMPORTANT!

Before proceeding to hitching to tractor the user must familiarise himself with the content of these instructions and additional publications attached to machine and observe all recommendations.

External inspection

- Check completeness of machine (standard and additional equipment).
- Check condition of protective paint coat,
- Check technical condition and set of safety guards.
- Inspect trailer's individual components for mechanical damage resulting from incorrect transport (dents, piercing, bent or broken components),
- Check technical condition of tyres and tyre pressure,
- Check technical condition of elastic hydraulic conduits,
- Check technical condition of pneumatic conduits,
- Check that there are no hydraulic oil leaks.

Prepare trans-shipment trailer for first start-up

- Check all lubrication points, lubricate the machine as needed according to recommendations provided in section 5,

- Check if the nuts and bolts fixing the wheels, the drawbar and front conveyor are properly tightened,
- Drain air tank of the brake system.
- Ensure that pneumatic, hydraulic and electric connections in agricultural tractor are according to the requirements, if not the trans-shipment trailer should not be hitched to the tractor.
- Ensure that the attached articulated telescopic shaft may be connected to the tractor, check rotation direction of tractor PTO.

Test start

If all the above checks have been performed and there is no doubt as to the trans-shipment trailer's good technical condition, it may be connected to tractor. Start the tractor, check all systems and test the trans-shipment trailer (without load in load box). It is recommended that the inspection is conducted by two people, one of which should always remain in the tractor's cabin. Test start should be conducted according to the sequence shown below.

- Connect trans-shipment trailer to appropriate hitch on agricultural tractor.
- Raise and secure support foot.
- Connect brake, electrical and hydraulic system conduits.
- Place electronic counter in tractor operator cab,connect counter power supply.
- Start tractor.
- Regulate hydraulic clutch supply pressure
- Check correct operation of lights and indicators.
- When moving off check if the main brakes operate correctly,
- Raise folded conveyor, ensure that it is properly locked in upper setting.
- Start tractor PTO drive (starting vertical conveyor drive).
- After three minutes operation of vertical conveyor start hydraulic clutch (starting container auger conveyors drive).
- Open and close container channels slides.

- Disconnect PTO drive, turn off tractor engine, unhitch trans-shipment trailer from tractor.

TIP

Service operation hitching/unhitching from tractor, regulation of clutch pressure supply etc. are described in detail in further parts of the instructions.

The trans-shipment trailer may be hitched only when all preparatory activities including inspection of technical condition have been completed satisfactorily. If during test start worrying symptoms occur such as:

- noise and abnormal sounds originating from the abrasion of moving elements of the trans-shipment trailer construction,
- hydraulic oil leak,
- pressure drop in brake system,
- incorrect hydraulic system operation
- blocking of pneumatic pistons,
- other suspected faults,

immediately disconnect oil supply to hydraulic clutch and disconnect tractor PTO drive. If a fault cannot be rectified or the repair could void the guarantee, please contact retailer for additional clarifications or to perform repair.

DANGER

Careless and improper use and operation of the trailer, and non-adherence to the recommendations included in these instructions are dangerous to health.

The machine must never be used by persons, who are not authorised to drive agricultural tractors, including children and people under the influence of alcohol or other drugs.

Non-adherence to the principles of safe use creates a danger for the health and life of the operator and others.

4.2 ATTACHING TO TRACTOR

Ensure that pneumatic, hydraulic and electric connections and the hitch of agricultural tractor are according to the Manufacturer's requirements, if not the trans-shipment trailer should not be hitched to the tractor.

In order to hitch the trans-shipment trailer to the tractor perform the actions below in the sequence presented. Machine must be immobilised by parking brake.

Connection

- Position agricultural tractor directly in front of drawbar eye.
- With the aid of the support regulate the height of the drawbar with regard to the hitch of the tractor.
- Reverse tractor, hitch trans-shipment trailer, check hitch lock protecting machine against accidental unhitching.
- Turn off tractor ignition.
- Raise support foot upwards, secure it with pin, move crank to central position (neutral position).
- Connect pneumatic system conduits (applies to two conduit systems):
  - ⇨ Connect pneumatic conduit marked yellow with yellow socket in tractor.
  - ⇨ Connect pneumatic conduit marked red with red socket in tractor.
- Connect pneumatic system conduits (applies to single conduit systems):
  - ⇨ Connect pneumatic conduit marked black with black socket in tractor.
- Connect main conduit supplying electric lighting system and conduit supplying vertical conveyor auxiliary lamp.
- Place electronic counter in tractor operator cab, connect counter to cigarette lighter power supply.
- Connect hydraulic turning interlock system conduit (blue).
- Connect two conduit slide and conveyor system (red).

- Connect to conduit hydraulic clutch system (black). Conduit with mounted return valve should be connected to socket "slow pouring" by-passing hydraulic manifold.

DANGER

When hitching, there must be nobody between the trailer and the tractor. When hitching the machine, tractor driver must exercise caution and make sure that nobody is present in the hazard zone.

Be especially careful when attaching the machine.

When connecting the hydraulic conduits to the tractor, make sure that the hydraulic systems of the tractor and trans-shipment trailer are not under pressure.

During connection of braking system conduits the correct sequence of conduit connection is very important. First in sequence connect yellow coloured plug to yellow socket in tractor, and then afterwards the red coloured plug to the red socket in tractor. Once the 2nd conduit connected, the braking system will switch to normal mode of operation (disconnection or piercing of the conduits causes the trailer's braking system control valve to automatically apply brakes).

FIGURE 4.1A CONDUIT COLOUR MARKING

CONDUIT / SYSTEM	COLOUR
Double conduit pneumatic system [(1)]:	
- supply conduit	RED
- control conduit	YELLOW
Single conduit pneumatic system:	
- supply conduit	BLACK
Hydraulic system	
- turning interlock	BLUE
- slide bolts and conveyor	RED
- hitch	BLACK

[(1)] - Applies to two conduit pneumatic systems equally the automatic and three position braking force regulator

ATTENTION!

Trans-shipment trailer may only be hitched to a tractor, which has the appropriate connection sockets for braking, hydraulic and electrical, and hydraulic oil in both machines is the same type and also the tractor hitch is capable of bearing the vertical drawbar loading of the loaded trailer.

When attaching is completed, secure the electrical leads and hydraulic and braking system conduits in such a way that they do not become entangled in tractor's moving parts and are not at the risk of breaking or piercing when making turns.

4.3 TRANS-SHIPMENT TRAILER SUPPORT OPERATION

Setting proper height of drawbar eye in relation to tractor hitch is achieved by the aid of support with mechanical gearing - figure (*4.1A*).

In order to reduce the force necessary to raise trans-shipment trailer drawbar, place support crank (3) in position (B). In this position there is greater mechanical gearing leverage, support foot (2) moves slowly, but little force is necessary to raise the front of the machine.

Raising support

- Remove safety pin (5).
- Move support crank from neutral position (A) to position (B).
- Turn the crank anticlockwise to raise support foot maximally.
- Place safety pin in position.
- Place crank in neutral position (A).

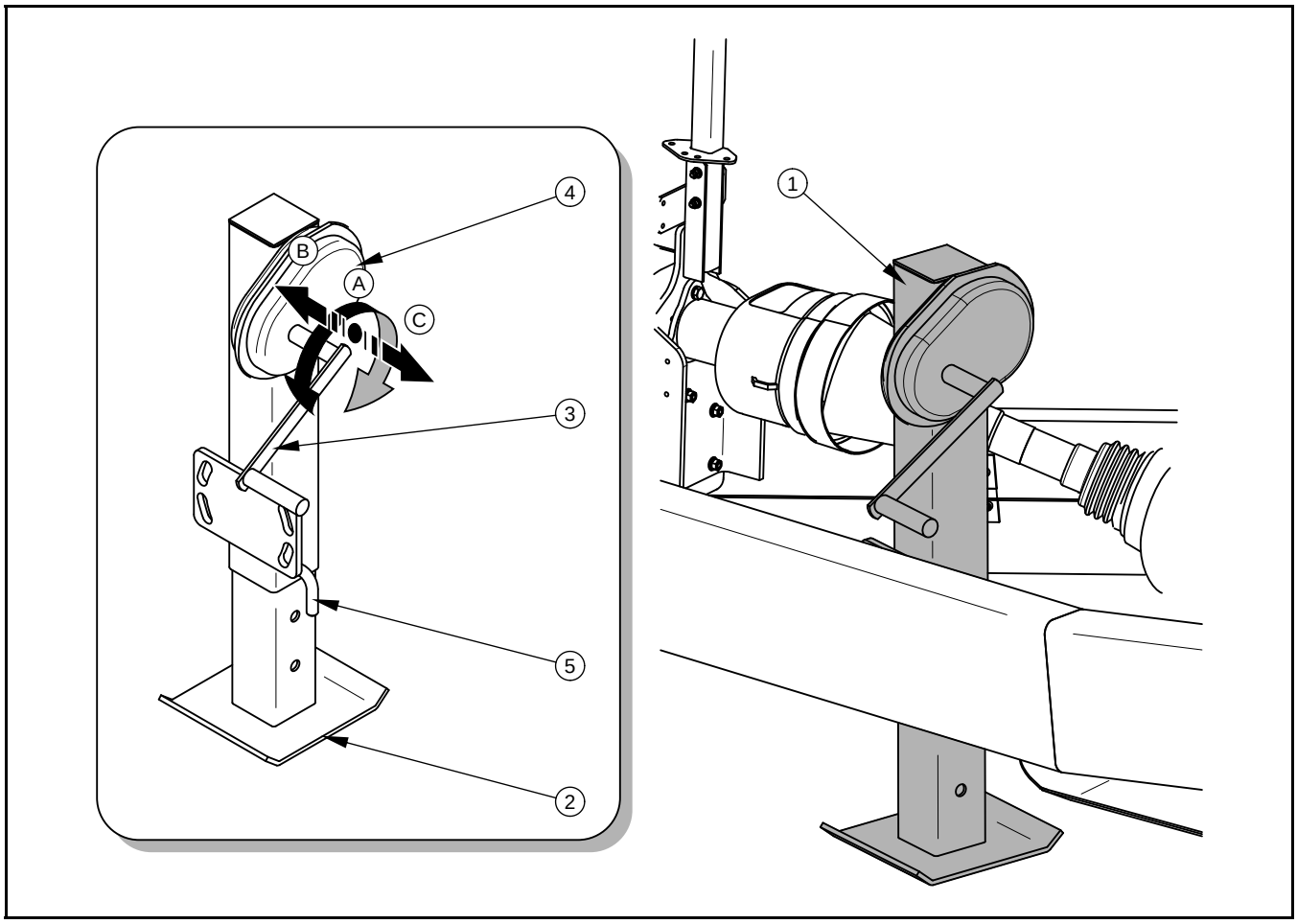


FIGURE 4.1A FOLD SUPPORT LEG

(1) support (2) support foot, (3) crank, (4) gearing, (5) securing pin, (A) neutral position (B) gear position I , (C) gear position II

Lowering support

- Remove safety pin.
- Set crank in position (B) or (C).
- Turn crank clockwise to lower support to the ground, with regard for regulating drawbar height in relation to hitch (if trans-shipment trailer shall be hitched to tractor).
- Place safety pin in position, and set crank in neutral position (A).

IMPORTANT!

Do not move and drive with lowered support.

4.4 LOADING

Load box can be loaded only when the trailer is connected to the tractor and positioned horizontally. Always aim at distributing the load uniformly in the load box. This will ensure stability when travelling and correct axle and drawbar loads.

DANGER

The trans-shipment trailer maximum carrying capacity must not be exceeded.

People or animals must not be carried.

Before beginning loading make certain that the chute slide gate and inspection slides are properly closed and secured. Take tarpaulin cover straps out of clamps on container sides and roll tarpaulin cover to the left side of trans-shipment trailer. Tarpaulin cover should be rolled while standing on the platform placed on the rear side wall. Rolled tarpaulin cover should be supported by bracket bolted to load box side extension.

DANGER

Exercise particular care when rolling tarpaulin cover. During work use the rear platform or ladder of appropriate height or ramp.

Loading work should be conducted by person having experience of this type of work.

During loading on the move maintain a constant distance between machines and synchronise travel speed of both machines.

Trans-shipment trailer may be loaded travelling in parallel to the combine harvester. Operators of both machines must synchronise travel speed and maintain particular care during the operation. During such time trans-shipment trailer conveyor must be folded. Load should be distributed evenly in load box.

If the trans-shipment trailer is equipped with a weighing system, it may be used to determine the actual degree of container loading.

With regard to the varying density of materials, using the total load box capacity may cause exceeding permissible carrying capacity of the trailer.

ATTENTION!

Do NOT exceed permissible load weight of trailer because this may cause danger while travelling and cause damage to the machine.

4.5 SECURING LOAD

Regardless of the type of load carried, the user is obliged to secure it in such a manner that the load is unable to spread and cause contamination of the road. Before beginning loading make certain that the inspection slides and chute slide are properly closed and load cannot spill out.

To secure load use tarpaulin cover, with which it should be covered whenever trans-shipment trailer moves on public roads.

Load protection with tarpaulin cover

- Standing on rear platform unroll tarpaulin cover using crank.
- Attach all pull straps to clamps on container.
- Pull tarpaulin cover from the right side.
- Pull tarpaulin cover to the front and finally to the rear wall of the load box.

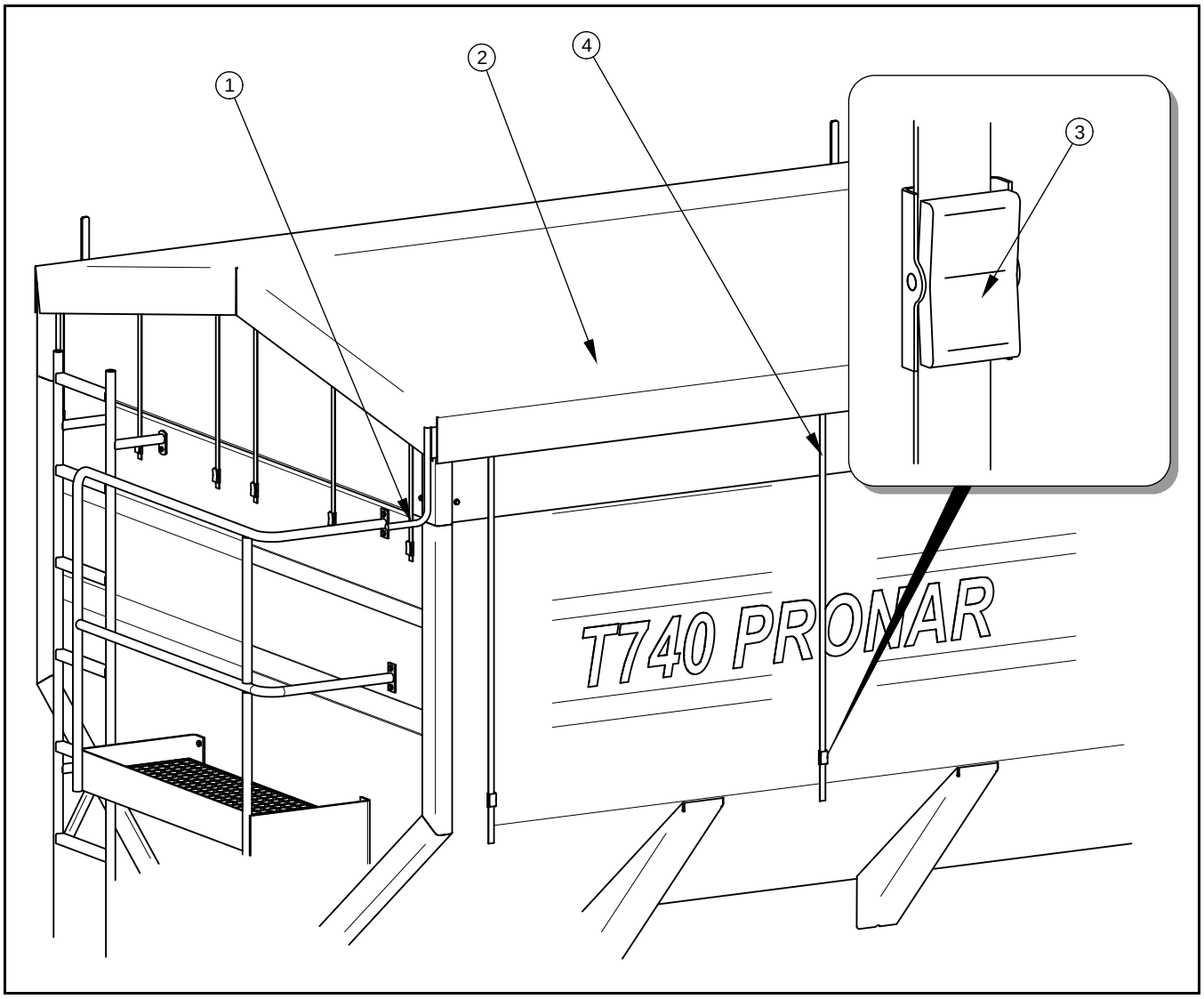


FIGURE 4.2A TARPAULIN COVER

(1) crank strip, (2) tarpaulin cover, (3) strap clamp, (4) fastening strap

4.6 TRANSPORTING THE TRAILER

When travelling on public or private roads, respect the road traffic regulations, exercise caution and prudence. Listed below are the key guidelines for driving the tractor and trailer combination.

- Before moving off make sure that there are no bystanders, especially children, near the trailer or the tractor. Take care that the driver has sufficient visibility.
- Set braking force regulator according to the degree of loading of the load box (does not apply to trans-shipment trailer equipped with braking system with automatic regulator).

- Raise trans-shipment trailer support and secure it in transport position.
- Ensure that trans-shipment trailer is properly hitched to the tractor and that the tractor hitch has been properly secured.
- While reversing immobilise rear turning axle with the aid of turning interlock cylinder rams.
- The trans-shipment trailer must not be overloaded, loads must be uniformly distributed so that the maximum permissible axle and drawbar loads are not exceeded. The trans-shipment trailer's maximum carrying capacity must not be exceeded as this can damage the machine and pose a risk to the operator or other road users.
- Permissible design speed and maximum speed allowable by road traffic law must not be exceeded. The towing speed should be adapted to the current road conditions, load carried by the trailer, road surface conditions and other relevant conditions.
- In the event of trailer malfunction, pull over on the hard shoulder avoiding any risk to other road users and position reflective warning triangle according to traffic regulations.
- While driving on public roads the trailer must be fitted with a certified or authorised reflective warning triangle. When driving, comply with all road traffic regulations, indicate an intention to turn using indicator lamps, keep all road lights and indicator lights clean at all times and ensure they are in good condition. Any damaged or lost lamps or indicator lights must be immediately repaired or replaced.
- Avoid ruts, depressions, ditches or driving on road side slopes. Driving across such obstacles could cause the trailer or the tractor to suddenly tilt. This is of special importance because loaded trailer's centre of gravity is higher, which reduces safety. Driving near ditches or channels is dangerous as there is a risk of the wheels sliding down the slope or the slope collapsing.
- When driving, avoid sharp turns especially on slopes.
- Please note that the braking distance of tractor and trailer combination is substantially increased at higher speeds and loads carried in the trailer.

- Speed must be sufficiently reduced before making a turn or driving on an uneven road or a slope.
- During reversing one should use the assistance of another person, who gives directions standing clear of the danger zone.

4.7 UNLOADING

Unloading with the aid of vertical conveyor

- Tractor and trailer must be placed to drive forwards on flat ground,
- Immobilise tractor and trailer with parking brake,
- Changes of lever setting (1) figure (*4.3A*) set in position (B) or (C).
- Extend vertical conveyor using tractor's manifold lever
- Start tractor PTO at speed of approx. 500 revs^{-1} (auger conveyor begins to rotate).
- Using tractor manifold lever start hydraulic clutch (drive to container augers is started). Gradually increase PTO revs, until a speed of 1,000 revs $^{-1}$ is reached.
- During unloading monitor working pressure of hydraulic clutch.

TIP

Time of unloading load box depends on the setting of the roof shield and covers placed in load box and on the rotation speed of container auger conveyors.

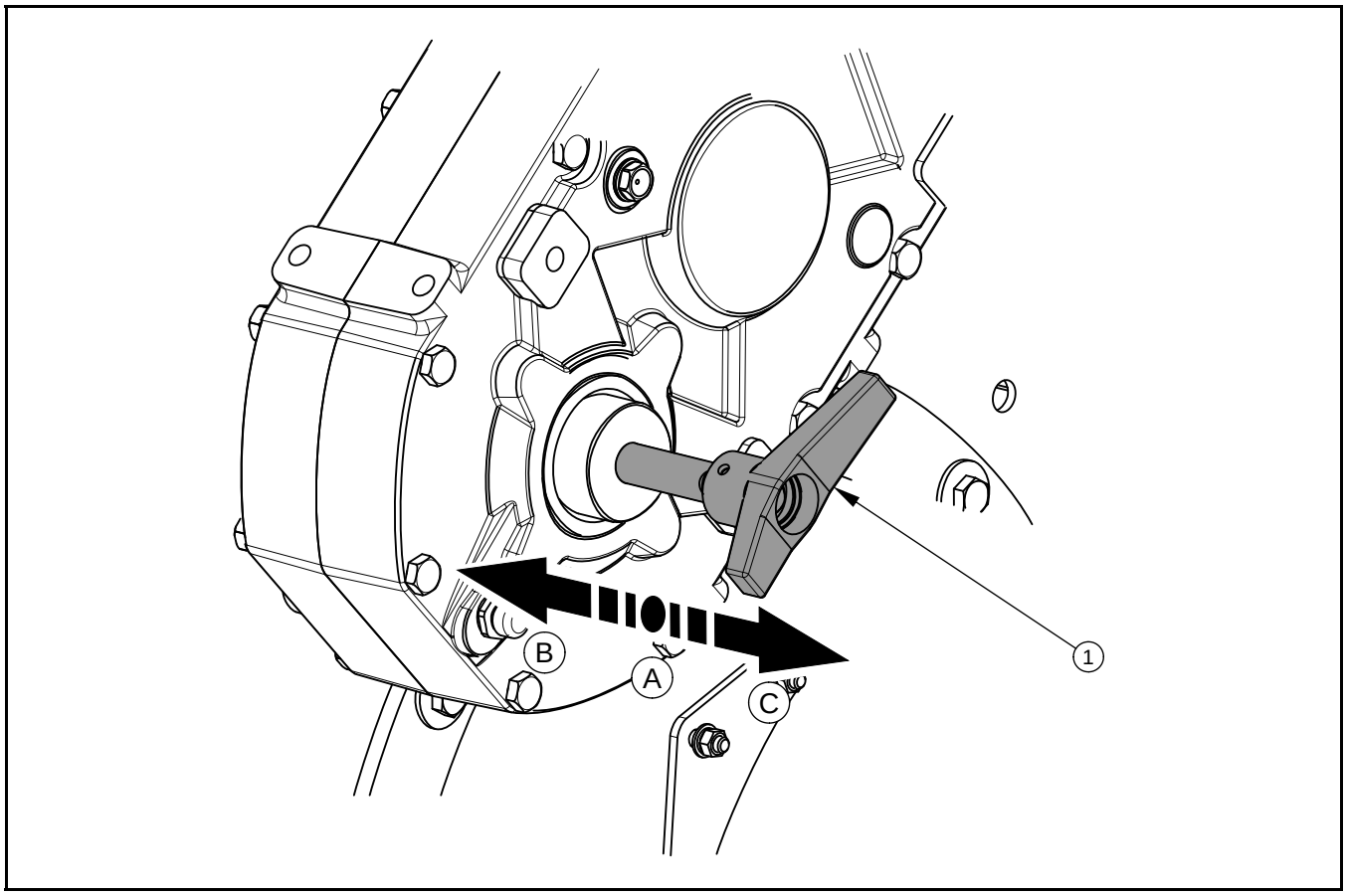


FIGURE 4.3A GEAR WHEEL TRANSMISSION

(1) changes of lever position, (A) neutral position, (B) RAPID REVOLUTIONS position, (C) SLOW REVOLUTIONS position

During unloading monitor the operation of vertical conveyor and drive assembly. In the event of overloading, sudden increase in pressure at clutch or drive fault then disconnect hydraulic clutch and then the tractor PTO drive.

TIP

In the final phase of unfolding the vertical conveyor the hydraulic ram speed should be significantly reduced. Failing to reduce speed during unfolding causes the impact and shakes the trans-shipment trailer.

Unloading with the use of channel chute

- Position trans-shipment trailer so that the channel chute is directly above reception hopper grating.

- Immobilise tractor and trailer with parking brake,
- Changes of lever setting (1) figure (*4.3A*) set in position (B) or (C).
- Open chute slide using tractor manifold lever
- Start tractor PTO with the lowest rotation speed possible (auger conveyor begins to rotate).
- Wait until grain ceases to fall out of chute.
- Using tractor manifold lever start hydraulic clutch for a few seconds (drive to container auger is started).
- Disconnect clutch. Operation of auger conveyors in container must be short enough so that grain from the collecting shaft does not reach the vertical conveyor.
- During unloading monitor working pressure of hydraulic clutch.

During unloading using the channel chute there is no need to unfold the vertical conveyor. The load from the container shall pour directly to the reception hopper grating. In the event of overload, sudden increase in pressure at clutch or drive fault, immediately disconnect hydraulic clutch and then the tractor PTO drive.

Unloading using channel chute should be performed with the aid of another person, who was standing at a safe distance shall observe whether all of the grain pours out of the chute. Clutch should be started for a few seconds, because longer work of container conveyors causes grain to reach vertical conveyor.

IMPORTANT!

In each case after changing tractor towing the trans-shipment trailer, or after a longer period of not using the trailer it is essential to regulate the hydraulic clutch working pressure. Do not start clutch without prior regulation.

DANGER

Ensure that during unloading nobody is in the vicinity of the danger zone. Keep a safe distance from moving elements of trans-shipment trailer.

Do not stand directly below vertical conveyor.

4.8 DISCONNECTING FROM TRACTOR

Disconnecting trans-shipment trailer

- Stop tractor, immobilise trailer with parking brake and if needed place wedges under wheels,
- Remove safety pin from support, release support.
- Disconnect from the tractor all electrical system leads as well as hydraulic and braking system conduits,
- Unhitch trans-shipment trailer drawbar eye from tractor hitch and drive tractor away.

Wheel wedges shall be so placed that one of the is in front of the wheel and the second is behind it.

Pneumatic system conduits must be placed in the sockets designed for this purpose positioned on the drawbar bracket. Hydraulic system conduits should be secured with the aid of attached clamps and suspend in sockets on the same bracket.

4.9 PROPER USE AND MAINTENANCE OF TYRES

- When working on the tyres, wedges or other objects without sharp edges should be placed under the wheels of the trans-shipment trailer to prevent it from rolling. A wheel may be taken off the trailer axle only when the trailer is not loaded.
- Repair work on the wheels or tyres should be carried out by persons trained and entitled to do so. This work should be carried out using appropriately selected tools.
- After removing a wheel, always check how firmly the nuts are screwed in. Inspection should be carried out each time after first use, and then every 50 – 100 kilometres of travel.
- Regularly check and maintain correct pressure in tyres according to instructions (especially if trailer is not used for a longer period).

- Pressure and tyres should be also checked after the whole day of intensive work. Please note that higher temperatures could raise tyre pressure by as much as 1 bar. At high temperatures and pressure reduced load or speed.
- Do not release air from warm tyres to adjust the pressure or the tyres will be underinflated when temperatures return to normal.
- Protect valves using suitable caps to avoid soiling.
- Do not exceed the trailer's maximum design speed.
- Avoid potholes, sudden manoeuvres or high speeds when turning.

4.10 WEIGHER OPERATION

4.10.1 MOUNTING INDICATOR

Weight indicator should be placed in tractor operator cab. Panel should be secured with the aid of rubber suction to windscreen. Select mounting place, we are indicator shall be visible and animal operation will not cause difficulty during driving the tractor. After securing indicator then connect conduit supply connecting attached to weighing system. Conduit should be connected to panel socket – connection POWER, supply plug should be connected to lighter socket. The second conduit - signal, should be connected to display panel - LOAD CELL socket (second terminal of conduit is permanently connected to terminal connection box).

IMPORTANT!

Supplied conduit must be disconnected during battery charging.

FIGURE 4.4A SUPPLY CABLE STRAND MARKING

ITEM	COLOUR	INTENDED USE
1	RED	Power supply +12V DC
2	BLACK	Ground
3	ORANGE	Not used
4	BLUE	Not used

FIGURE 4.1A SIGNAL CABLE STRAND MARKING

ITEM	COLOUR	INTENDED USE
1	WHITE	Signal (+)
2	GREEN	Signal (-)
3	RED	Induction (+)
4	BLACK	Induction (-)

TIP

Power supply and signal lead plugs are so designed that it is impossible to connect them incorrectly to the indicator panel.

4.10.2 STANDARD WORK

Switching weigher on.

- Press ON/OFF button . A short HELLO message appears. Weigher moves into weighing mode GROSS (total weight). Mode GROSS illuminates the change in weight since the last weigher zeroing.
- Press GROSS/NET button and within three seconds press ZERO button. "0" appears on the screen confirming completion of weigher zeroing, weigher moves to GROSS (total weight) weighing mode.

GROSS and NET mode

In GROSS mode the change in weight since the last weigher zeroing is displayed. Weigher is in GROSS mode, if flashing arrow points to GROSS text (notice on right side of display window).

NET mode indicates change after performance of operation TARE (vehicle weight). TARE is temporarily a zero point. The weigher is in NET mode, if the flashing arrow indicates NET text (notice on right side of display window).

Switching between NET and GROSS modes.

GROSS/NET button is an alternative function button. If the weigher is in GROSS mode, then after pressing the GROSS/NET button the weigher sets itself in NET mode. If the weigher is in NET mode, then after pressing GROSS/NET button the weigher sets itself in GROSS mode.

Switching weigher off.

Press and hold ON/OFF button until BYE notice appears on display.

SECTION

5

TECHNICAL MAINTENANCE

PRELIMINARY INFORMATION
TRANS-SHIPMENT TRAILER SERVICE INSPECTION
UNLOADING SPEED REGULATION
CONSUMABLES
HYDRAULIC CLUTCH OPERATION
THOROUGH LOAD TANK CLEANING
CLEANING TRANS-SHIPMENT TRAILER
STORAGE
TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS
LIST OF BULBS
FAULTS AND MEANS OF REMEDYING THEM

5.1 PRELIMINARY INFORMATION

When using the trans-shipment trailer, regular inspections of its technical condition are essential and the performance of maintenance procedures, which keep the machine in good technical condition. In connection with this the user of the trans-shipment trailer is obliged to perform all the maintenance and regulation procedures defined by the Manufacturer.

Repairs during the guarantee period may only be performed by authorised service points.

Detailed procedures and extents of functions are described in this section, which the user may perform with his own resources. In the event of unauthorised repairs, changes to factory settings and other actions which are not regarded as possible for the trans-shipment trailer operator to perform, the user shall invalidate the guarantee.

5.2 TRANS-SHIPMENT TRAILER SERVICE INSPECTION

TABLE 5.1 MAINTENANCE SERVICE PROCEDURES SCHEDULE

OPERATION NUMBER	DESCRIPTION	FREQUENCY						
		A	B	C	D	E	F	G
1	Inspection of wheel axle bearings		•				•	
2	Inspection and regulation of main brake							•
3	Inspection and regulation of parking brake							•
4	Draining water from air tank			•				
5	Cleaning drain valve							•
6	Inspection of connections				•			
7	Inspection of action of braking system				•			
8	Inspection of braking system tightness			•				•

9	Cleaning the air filters					•		
10	Inspection of hydraulic system tightness			•				•
11	Inspection of lighting and signalling system				•			•
12	Inspection of nut and bolt tightness on wheels and drawbar	See 5.2.12						
13	Inspection of greasing points	According to schedule						
14	Technical inspection of wheels					•		
15	Regulation of working pressure of clutch	See 5.2.15						
16	Inspect chain tightness of front chain transmission (I stage)	See 5.2.16						
17	Inspect chain tightness of front chain transmission (II stage)	See 5.2.17						
18	Inspect chain tightness of front chain transmission (III stage)	See 5.2.18						
19	Inspect chain tightness of rear chain transmission	See 5.2.19						
20	Change oil in gear wheel transmission	After the first 50 hours of work and then every 500 hours						
21	Change oil in conveyor intersecting axis gearing	After the first 50 hours of work and then every 500 hours						

TABLE 5.2 INSPECTION PERFORMANCE FREQUENCY

FREQUENCY	INSPECTION	DESCRIPTION
A	After first use	Perform service after first travel of trans-shipment trailer (without load) - once only inspection.
B	After first travel with load	Perform service after first travel of trans-shipment trailer (with load) - once only inspection.
C	After a week of use	Perform inspection after first week of normal use of trans-shipment trailer – once only inspection (does not apply to draining water from air tank).
D	Daily	General check of technical condition of individual trans-shipment trailer sub-assemblies.
E	3 months	Perform inspection after 3 months of normal use of trans-shipment trailer - repeat inspection every 3 months of use.
F	6 months	Perform inspection after 6 months of normal use of trans-shipment trailer - repeat inspection every 6 months of use.
G	12 months	Perform inspection after 12 months of normal use of trans-shipment trailer - repeat inspection every 12 months of use. It is recommended to make an inspection before commencing the season of machine use.

5.2.1 OPERATION NO. 1 - INSPECTION OF WHEEL AXLE BEARINGS

In a newly purchased trailer, after the first week of use or covering a distance of 100 km, while during further use – after 6 months of vehicle use check and regulate wheel axle bearings when needed. Worn or damaged bearing should be replaced.

Required service actions

- Hitch trans-shipment trailer to tractor, braking tractor with parking brake. Place blocking wedges or other objects without sharp edges under the trans-shipment trailer wheels and raise wheels in succession using the appropriate lifting jack. The lifting jack should be placed under the axle between U bolts fixing shock absorber leaf springs to the axle. Make certain that the trans-shipment trailer will not move during inspection of the bearings.
- Turning the wheel slowly in both directions check that movement is smooth and that the wheel rotates without excessive resistance.

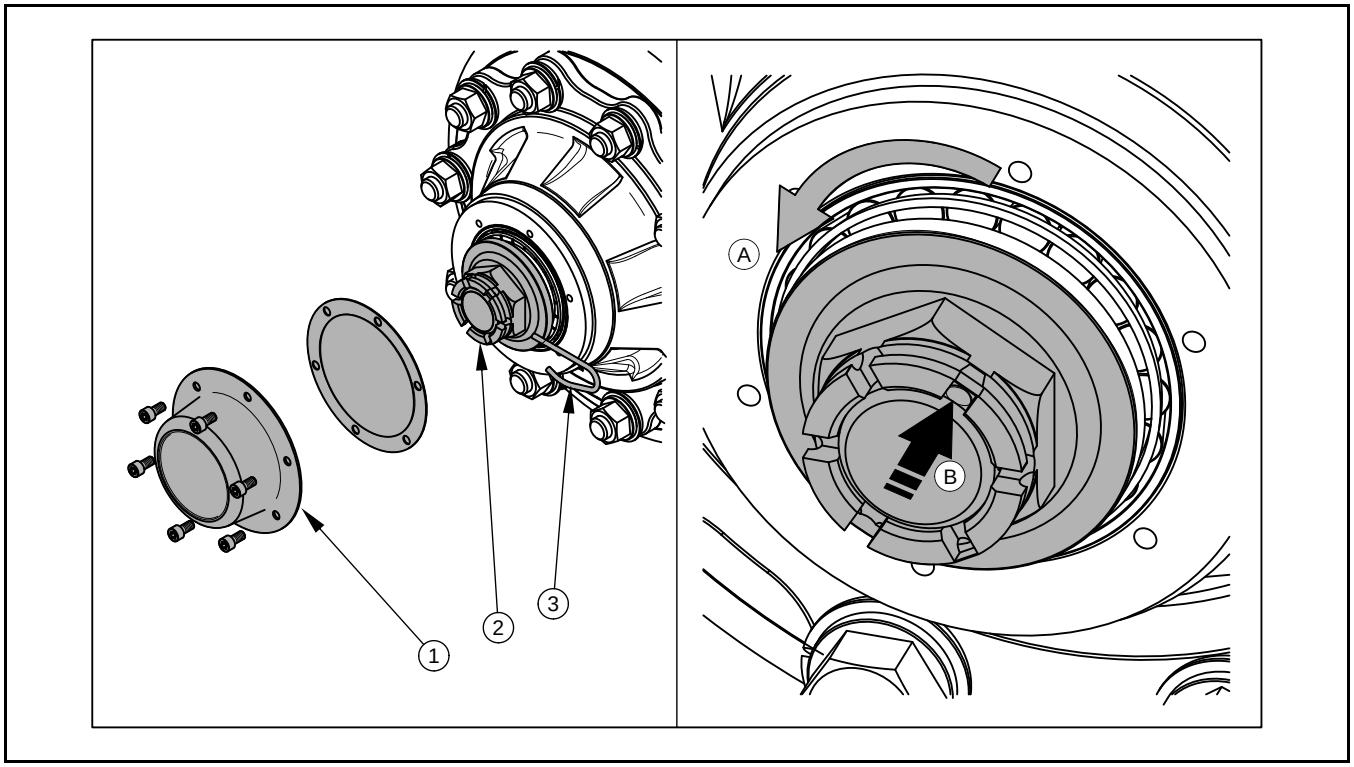


FIGURE 5.1A *REGULATION OF ROAD WHEEL AXLE BEARINGS*

(1) hub cover, (2) castellated nut, (3) securing split cotter pin

- Turn the wheel so that it rotates very quickly, check that the bearing does not make any unusual sounds.

- Grasp wheel above and below and try to feel any slack play, this may equally be checked with the aid of a jack placed under the wheel supported on the floor/ground.

If slack is felt, adjust bearing. Unusual sounds coming from bearing may be symptoms of excess wear, dirt or damage. In such an event the bearing, together with sealing ring, should be replaced with new parts.

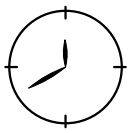
Bearing regulation should be performed according to the following instructions – figure (*5.1A*):

- take off hub cover (1),
- take out split cotter pin (3) securing castellated nut (2),
- turning the wheel simultaneously tighten castellated nut until the wheel comes to a stop,
- unscrew nut (not less than1/3 rotation) to cover the nearest thread groove with alignment to opening in wheel stub axle
- secure castellated nut was cotter pin and mount hub cap.

The wheel should turn smoothly without faltering or detectable resistance not originating from abrasion of brake shoes in brake drum.

Inspection and regulation of bearings may only and exclusively be conducted, when the trailer is hitched to a tractor and trailer load box is empty.

Bearings replacement, lubrication and repairs connected with brake system and wheel axle should be entrusted to specialist service provider. For axle technical service, the user may only inspect the technical condition of the axle system, inspect bearing slack and their regulation.



Inspection and/or regulation of wheel axle bearings:

- After a week of use
- Every 6 months of use.

5.2.2 OPERATION NO. 2 - REGULATION OF MAIN BRAKE

Brakes regulation is necessary when:

- as a result of wear of brake shoe linings between lining and drum there is excessive slack and reduced braking effectiveness.
- wheel brakes do not brake evenly or simultaneously.
- repairs are made to braking system

If brakes are correctly regulated, braking of trans-shipment trailer road wheels takes place simultaneously. Brakes regulation consists of changing setting of axle shaft expander arm (2) in relation to expander shaft (1). To do this regulate the shaft position (2) with the aid of setting screw (3) in appropriate direction:

- in direction A, if braking is too early,
- in direction B, if breaking is too late.

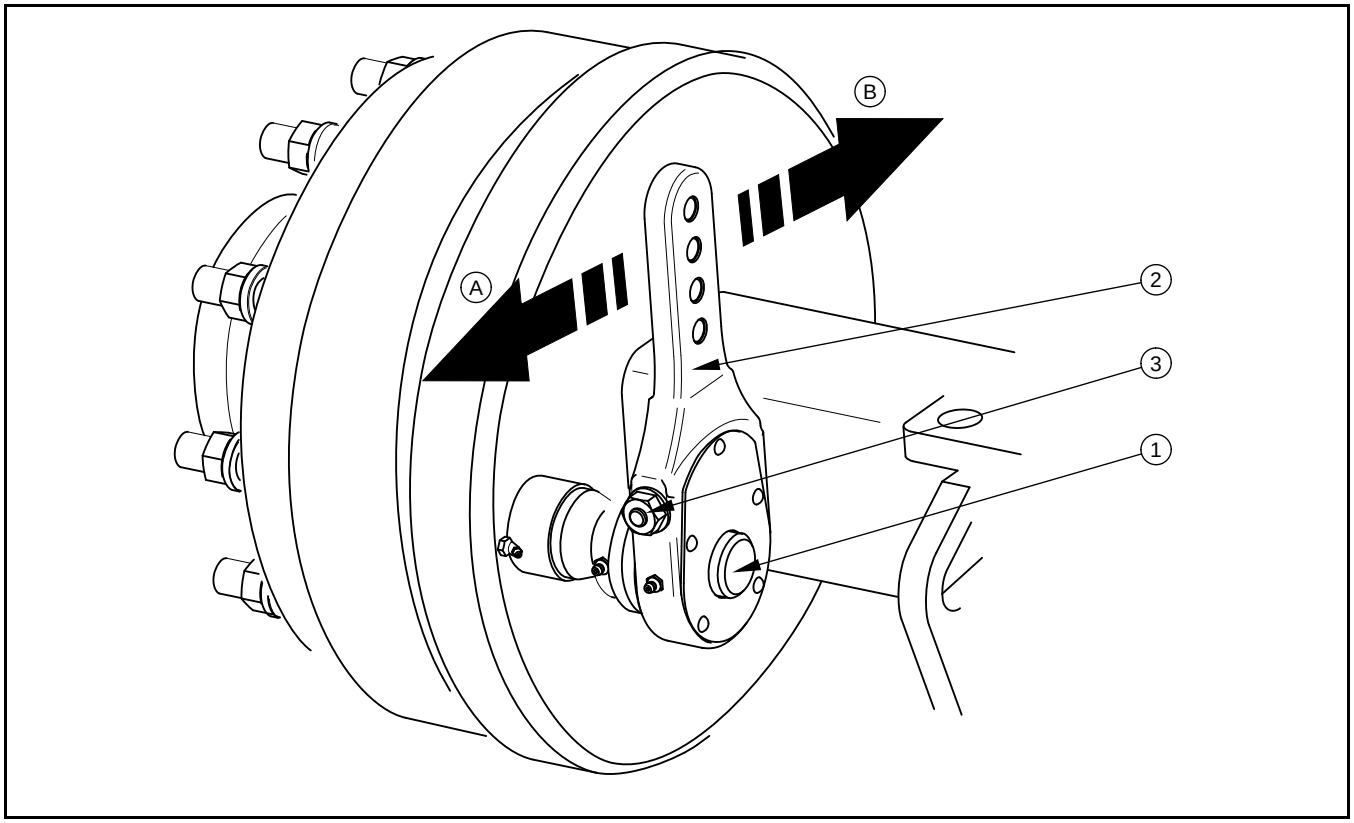


FIGURE 5.2A *REGULATION OF MAIN BRAKES*

(1) expander shaft, (2) expander arm, (3) regulation screw

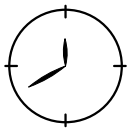
Regulation should be conducted separately for each wheel. After proper brake regulation, at full braking the axle shaft expander arm should create an angle of 90° with ram piston. Axle shaft expander arms must make the same movement and braking process must take place simultaneously on all wheels. After brake release expander arms may not be supported on

any construction elements, because too little withdrawal of a piston ram may cause abrasion of brake shoes in drum and result in overheating trans-shipment trailer brakes.

TABLE 5.3 MAIN BRAKE BRAKING FORCE

PARAMETER	MEASURED AS	VALUE
Main brake braking force	kN	115

With properly regulated brakes, trailer main brake braking force should reach a value not less than that given in table (*5.3*).



Inspection and regulation of main brake:

- Every 12 months
- if needed.

Difference in braking force may not be greater than 30%, considering that 100% constitutes greater force.

ATTENTION!

Main brake braking force, is the braking force of all trans-shipment trailer wheels.

Brake repairs, changes of brake linings etc. may be only undertaken in authorised service points. Making unauthorised repairs and modifications by the user voids the guarantee. Among the service operations which may be performed by the trans-shipment trailer user there is only brake regulation by changing the setting of expander arms.

5.2.3 OPERATION NO. 3 - REGULATION OF PARKING BRAKE.

Regulation of parking brake should be conducted in the event of:

- stretching of cable,
- loosening of parking brake cable clamps
- after regulation of main brake,
- after repairs in main brake system,

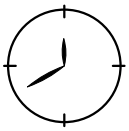
- after repairs in parking brake system.

Before commencing regulation make certain that the main break is functioning properly. Brake regulation must be performed according to the following sequence:

- park trans-shipment trailer on a level surface,
- wedges or other objects without sharp edges should be placed under the wheels,
- Unscrew maximally the brake mechanism screw (anticlockwise),
- loosen brake cable clamps,
- tighten cable and tighten clamps.

Length of parking brake cable should be so selected that at total release of working and parking brake the cable would be loose and hanging by 1 - 2 cm.

With properly regulated brakes, trailer parking brake braking force should reach a value not less than that given in table (5.4).



Inspection and regulation of parking brake:

- Every 12 months
- if needed.

Difference in braking force of left and right wheel may not be greater than 30%, considering that 100% constitutes greater force.

TABLE 5.4 PARKING BRAKE BRAKING FORCE

PARAMETER	MEASURED AS	VALUE
Parking brake braking force	kN	41.4

ATTENTION!

The braking force of the parking brake, is the braking force of the two front wheels of the trans-shipment trailer.

5.2.4 OPERATION NO. 4 - DRAINING WATER FROM THE AIR TANK

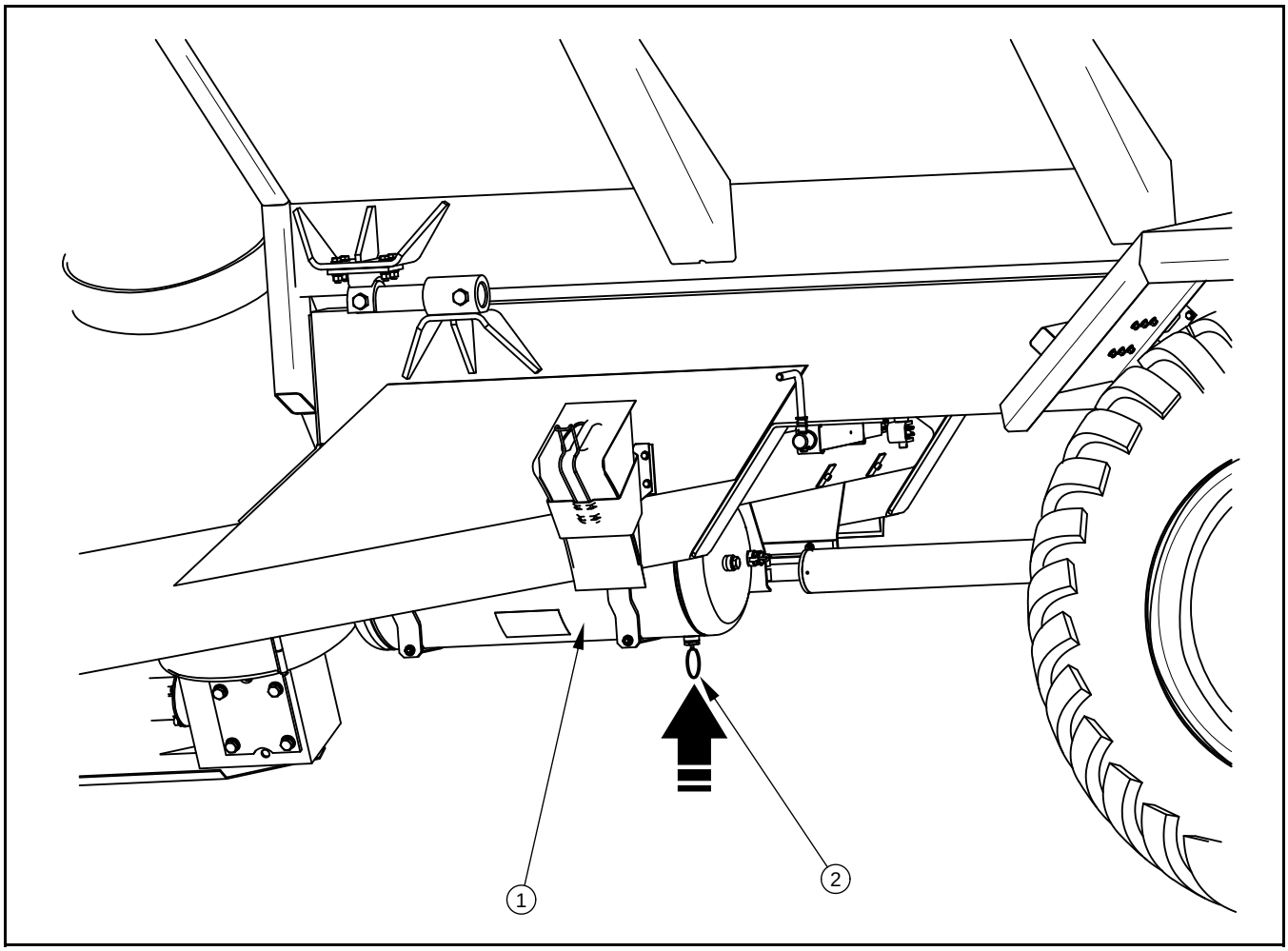


FIGURE 5.3A *DRAINING WATER FROM AIR TANK*

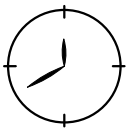
(1) air tank, (2) water release valve

Required service actions

- Open out drain valve (2) placed in lower part of tank.

- The compressed air in the tank causes the removal of water to the exterior. After release valve mandrel should automatically close and stop air flow from tank.

In the event, that the valve mandrel resists returning to its setting, then the whole drain valve must be one screwed and cleaned, all replaced (if it is damaged).



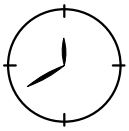
Draining water from air tank:

- after each week of use.

5.2.5 OPERATION NO. 5 - CLEANING DRAIN VALVE

Required service actions

- Release air from the tank.
- Unscrew valve.
- Clean valve, purge with compressed air.
- Change copper seal.
- Screw in valve, filtering with air, check tank tightness.



Cleaning valve:

- every 12 months (before winter period).

DANGER

Before dismantling drain valve release air from tank.

5.2.6 OPERATION NO. 6 - INSPECTION OF CONNECTIONS

Required service actions

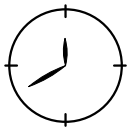
- Check technical condition of bodies of pneumatic, hydraulic and electrical connectors.

- Check electric contacts.
- Check condition of pneumatic connector seals, check condition of safety covers.

Damage including cracking of body, burnt or broken electrical contacts, damage thread classifies contact for replacement. In the event of damage to or seal of pneumatic connector, these elements must be replaced with new reliable elements. Contact of pneumatic connector seals with oils, grease, petrol etc. may cause damage and accelerate ageing process.

If the trans-shipment trailer is unhitched from the tractor, contact should be protected by cover or placed in its designated socket.

Each time before connection of the machine inspect technical condition and cleanness of contacts and sockets in tractor.



Inspection of trans-shipment trailer connections:

- daily.

DANGER

Unreliable and dirty trans-shipment trailer connections may cause unreliability and faulty functioning of braking, electric or hydraulic system.

5.2.7 OPERATION NO. 7 – INSPECTION OF BRAKING SYSTEM ACTION

After correct hitching of trans-shipment trailer to tractor and starting engine, compressed air is transferred to braking system. If air pressure is too low trailer brakes will not be released and operator must wait until pressure reaches at least 0.5 MPa.

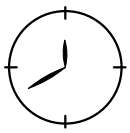
After moving off, inspect braking by pressing tractor brake pedal. If trailer wheels brake simultaneously on hard and level surface, the machine will not have a tendency to slide sideways, if there is an insignificant pressure drop in braking system one should consider the system to be reliable.

A metallic noise during braking, rapid heating of brake drums, uncontrolled slips sideways, jerking of trailer, too low air pressure, sudden pressure drop or other symptoms appearing during braking may be the cause of brake shoe lining wear, damage connectors or conduits, unreliability of control valve or other serious system faults. In such instances immediately

stop and check condition of connectors and check tightness of system. If fault cannot be detected and repair is impossible without breach of guarantee, contact service .and conduct braking system diagnosis and execution of repair.

DANGER

Do not use the trans-shipment trailer with damaged pneumatic system.



Inspection of action of braking system:

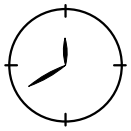
- daily.

5.2.8 OPERATION NO. 8 – INSPECTION OF BRAKING SYSTEM TIGHTNESS

As a part of trans-shipment trailer maintenance, conduct inspection of individual pneumatic systems, giving particular attention to all places of connection. Tightness of the system should be checked at nominal pressure in the system of approx. 0.6 MPa in single conduit systems, and approx. 0.8 MPa in two conduit systems. In order to check system tightness connect trans-shipment trailer to tractor and if necessary start tractor in order to bring system to the required pressure. To inspect tightness release brake pedal and press brake pedal of tractor (the help of the second person is required).

If conduits, seals or other system elements are damaged, compressed air will escape in these damaged places with a characteristic hiss. Lack of system tightness may be exposed by covering checked elements with washing fluid or other foaming preparations, which will not react aggressively with system elements. Damaged seals or conduits, causing leaks should be replaced. If the cause of the system leak is the outflow from a piston, control valve body or braking force regulator should be taken to authorised repair provider for repair or replacement of parts.

Contact of pneumatic leads with oils, greases, petrol etc. may cause damage and accelerate ageing process. Bent conduits, permanently deformed, cut or worn should be replaced.



Tightness inspection:

- After a week of use
- Every 12 months of use.

5.2.9 CLEANING THE AIR FILTERS

Depending on trailer working conditions, but not less than once in three months, take out and clean air filter inserts, which are placed in pneumatic system connection conduits. Inserts are used many times and are not subject to changing unless they are mechanically damaged. In order to clean insert first reduce pressure in supply conduit. Next remove securing slide (1) – figure (*5.4A*). Hold the filter cover (2) with the other hand. After removing slide lock, the cover is pushed off by the spring, in the filter housing. The insert and the filter body should be carefully washed out and blown through with compressed air. Assembly should be done in reverse order.

DANGER

Before proceeding to dismantle filter, reduce pressure in supply conduit. While disengaging filter slide gate, hold cover with other hand. Stand away from filter cover vertical direction.

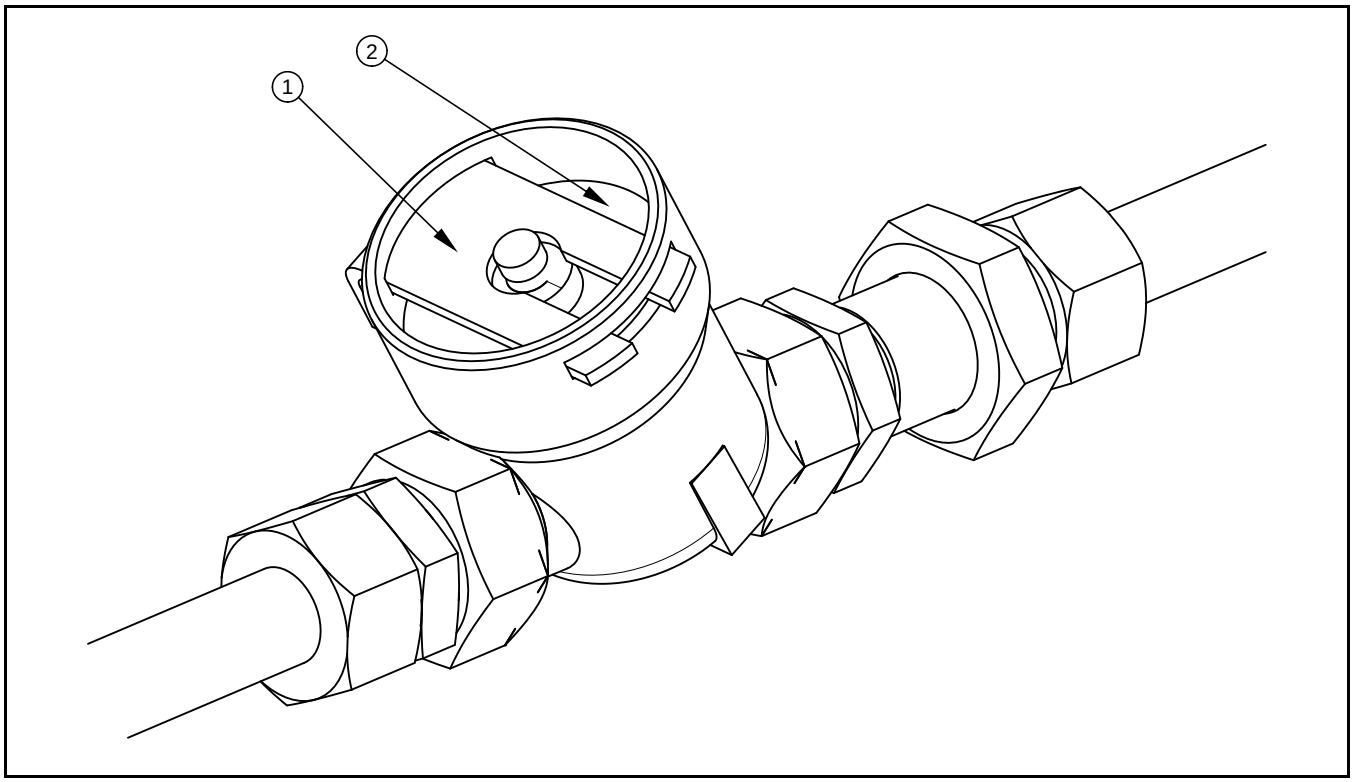


FIGURE 5.4A *AIR FILTER*

(1) securing slide lock, (2) air filter cover

Cleaning the air filter (filters):

- every 3 months of use,

5.2.10 OPERATION NO. 10 – INSPECTION OF HYDRAULIC SYSTEM TIGHTNESS

Required service actions

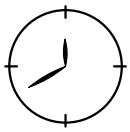
- Hitch trans-shipment trailer to tractor.
- Connect all hydraulic system conduits according to service instructions.
- Clean connectors and ram cylinders.
- Start in turn all systems without starting PTO drive (raising and bolting vertical conveyor, clutch system, chute slide system, turning block system),
- Check tightness of hydraulic system, inspect cylinders and hydraulic conduits.

In the event of confirmation of oil on hydraulic ram cylinder bodies ascertain origin of leak. Inspect hydraulic seals when ram cylinder is completely extended. Minimum leaks are permissible with symptoms of "sweating", however in the event of noticing leaks in the form of "droplets" stop using the trans-shipment trailer until the fault is remedied.

ATTENTION!

The trans-shipment trailer and tractor must not be attached if the hydraulic oil in the two machines is of different types.

Do not use the trans-shipment trailer with damaged hydraulic system.



Tightness inspection:

- After a week of use
- Every 12 months of use,

5.2.11 OPERATION NO. 11 - INSPECTION OF LIGHTING AND SIGNALLING SYSTEM.

Required service actions

- Hitch trans-shipment trailer to tractor.
- Switch on all lights in succession.
- Check completeness and technical condition of lights.
- Check completeness of all reflective lights.
- Check correct mounting of triangular slow-moving vehicle sign.
- Check connection conduit and conduit plug.
- Check condition of conduit group and connection blocks.

ATTENTION!

Travel with unreliable lighting and signalling system is forbidden. Damaged lamp lenses, and burned-out bulbs must be replaced before travelling.

Electrical system inspection:

- daily.
- Every 12 months of use,

Annual inspection of system does not relieve user of daily inspection of technical condition of lighting system.

5.2.12 OPERATION NO. 12 - INSPECTION OF TIGHTNESS OF WHEELS AND DRAWBAR NUTS AND BOLT CONNECTIONS

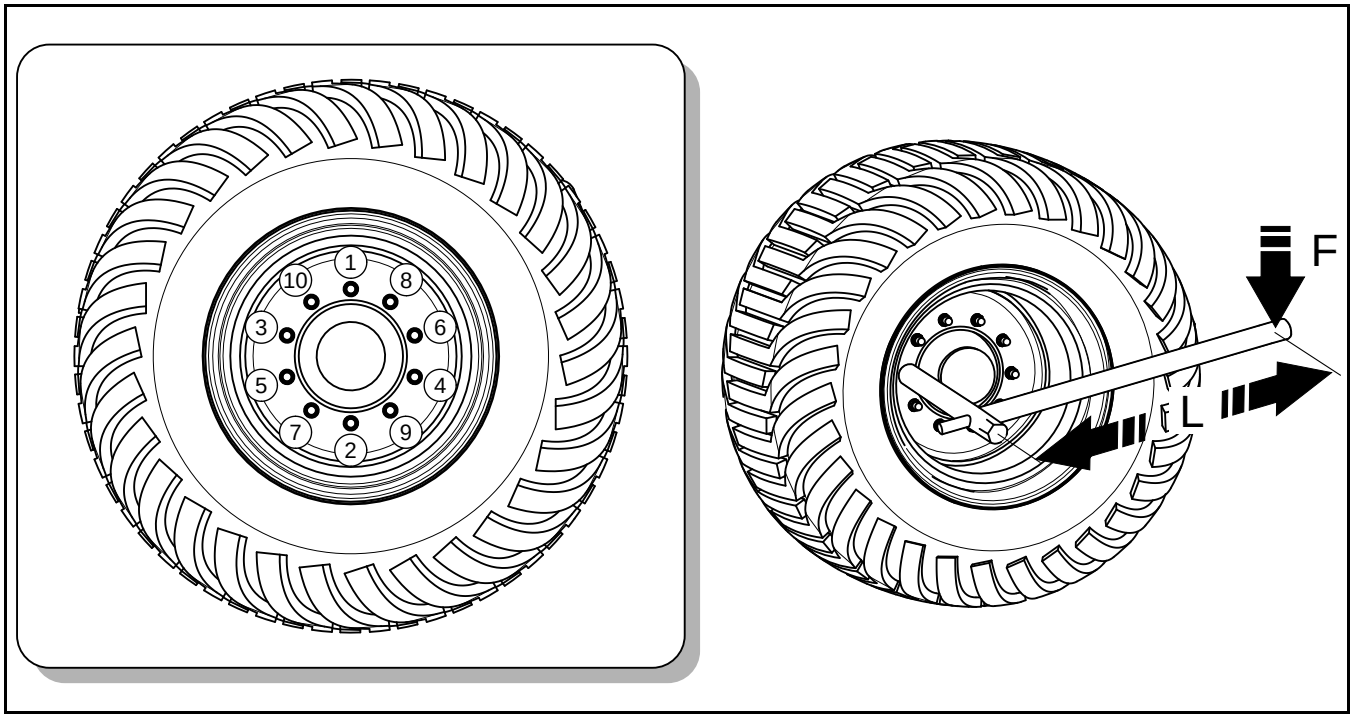


FIGURE 5.5A *TIGHTENING WHEELS NUTS*

(1) - (10) sequence of nut tightening, (L) spanner length, (F) user weight

Inspection of wheel axle and drawbar eye tightening:

- after first use (without loading),
- every 50 – 100 kilometres of travel.

Wheel nuts should be tightened using a torque of 450 Nm. Inspection of tightness should be carried out each time after first use, and then every 50 – 100 kilometres of travel. Nuts should be tightened gradually diagonally, using a torque spanner. If a torque spanner is not available, one may use an ordinary spanner. The arm of the spanner selected according to

the weight of the person tightening the nut. Remember that this method of tightening is not as accurate as the use of a torque spanner.

TABLE 5.5 SPANNER ARM

WHEEL TIGHTENING TORQUE [Nm]	BODY WEIGHT (F) [kg]	ARM LENGTH (L) [m]
450	60	0.75
	70	0.65
	80	0.55
	90	0.50

Drawbar eye tightness should be checked simultaneously with wheel nut tightness checking. Tightening torque should amount to 240 Nm. Nuts should be tightened gradually diagonally, using torque spanner.

Bolts and nuts should be in good technical condition. Corroded parts or those with damaged threads should be replaced.

5.2.13 OPERATION NO.9 - INSPECTION OF GREASING POINTS

TABLE 5.6 TRANS-SHIPMENT TRAILER GREASING SCHEDULE

ITEM	GREASING POINT	NUMBER OF GREASING POINTS	TYPE OF GREASE	FREQUENCY
1	Hub bearing	4	A	24M
2	Drawbar eye	1	B	14D
3	Turning axle connecting pins	2	A	3M

ITEM	GREASING POINT	NUMBER OF GREASING POINTS	TYPE OF GREASE	FREQUENCY
4	Turning axle stub axles	4	A	1M
5	Lever	4	A	3M
6	Expander shaft bracket sleeve	4	A	3M
7	Expander shaft sleeve in drum hub	4	A	3M
8	Support gearing	3	A	6M
9	Leaf spring absorbers	4	C	6M
10	Multi-flanged terminal of articulated telescopic shaft	1	B	14D
11	Rotating drawbar eye Sleeve	1	B	14D
12	Leaf spring absorber sliding surfaces	4	A	3M
13	Striker sleeve	1	A	3M
14	Sliding bearing of folding conveyor cylinder ram	2	A	3M
15	Lock sleeve	1	A	3M
16	Bolting ram securing pin	2	D	3M
17	Self-centering bearing	1	A	1M
18	Two conduit cone gearing (1)	1	E	500H

ITEM	GREASING POINT	NUMBER OF GREASING POINTS	TYPE OF GREASE	FREQUENCY
19	Upper conveyor bearing group	1	A	10H
20	Cylinder bolt and pin	5	D	3M
21	Hinge pin	4	A	3M
22	Parking brake mechanism	1	A	6M
23	Parking brake guide rollers pin	3	A	6M
24	Chain	4	F	10H
25	Bearing assembly	8	A	10H
26	Front gear wheel transmission	1	E	500H
27	Shaft elbows [2]	6		

[1] the first oil change is carried out after 50 hours work, [2] comply with the instructions of shafts Manufacturer, greasing periods – M month, D – day, H hour

A - permanent machine general-purpose grease

B - permanent grease for heavily loaded elements with addition of MOS_2 or graphite

C – anticorrosion preparation in aerosol

D – ordinary machine oil

E – SAE 90 EP gear oil

F – chain grease

Trailer greasing should be performed with the aid of a manually or foot operated grease gun, filled with generally available permanent grease based on lithium or lime soap. Before

beginning greasing in so far as is possible remove old grease and other contamination. After greasing machine according to instructions, wipe off excess grease.

Gear wheel transmission should be lubricated with gear oil according to classification SAE90 EP. Oil changing is discussed in further on in this section.

Before commencing greasing of gear chains, first wash them with generally available substances for this purpose. After complete drying, grease chains using a brush. After completing greasing start and run trans-shipment trailer for at least 1 hour.

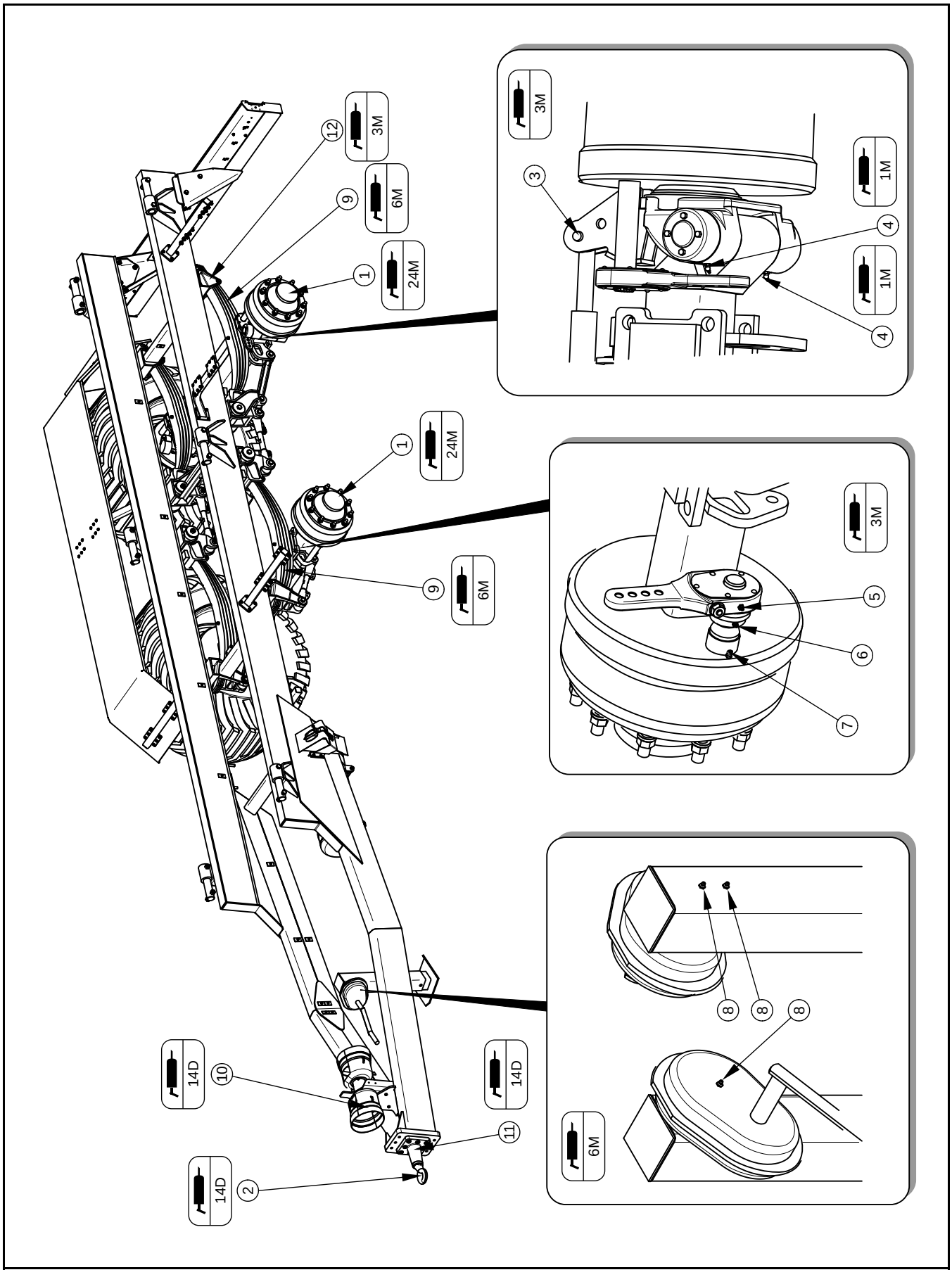


FIGURE 5.6A *TRAILER GREASING POINTS - CHASSIS*

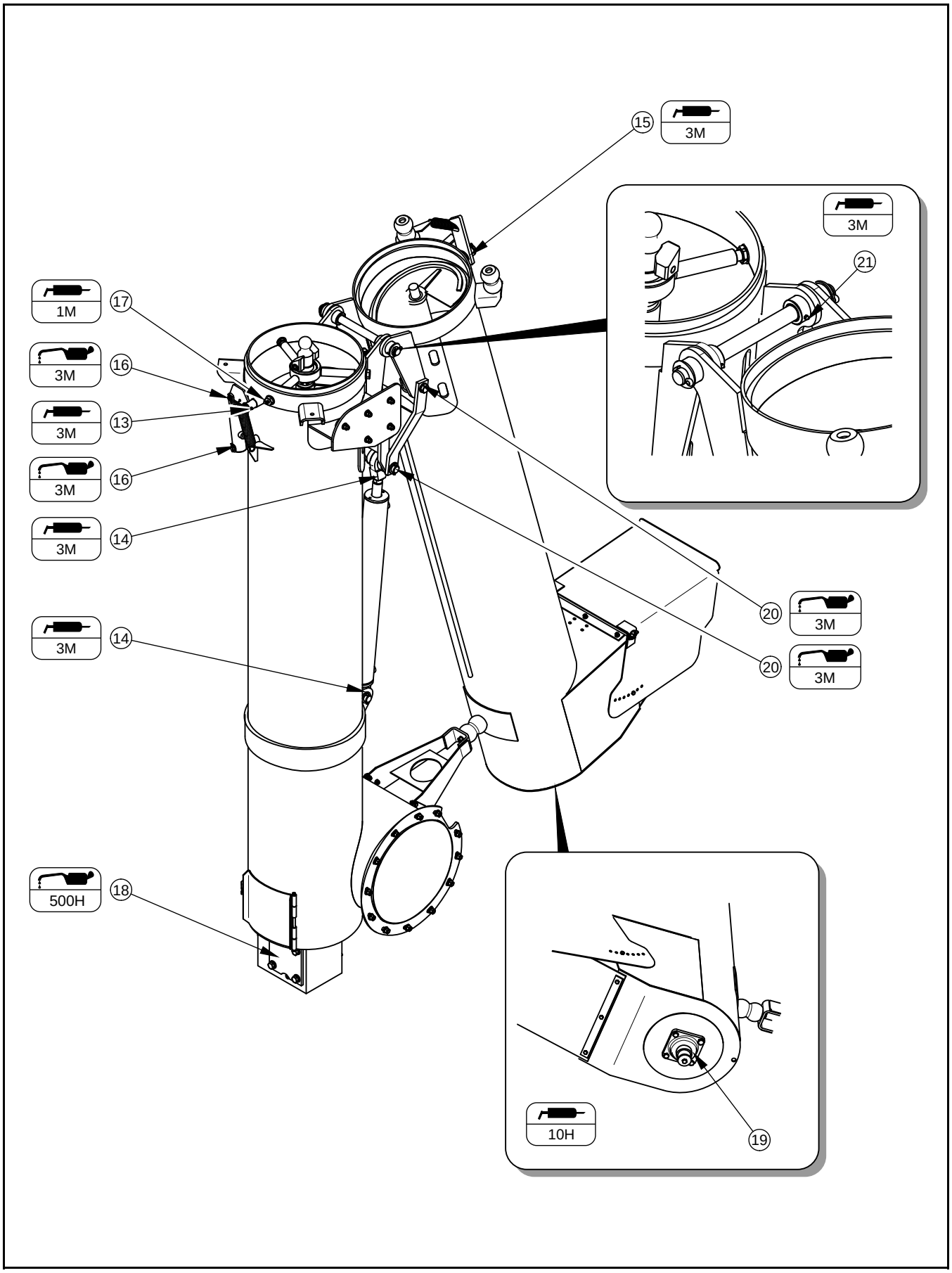


FIGURE 5.7A *TRAILER GREASING POINTS – VERTICAL CONVEYOR*

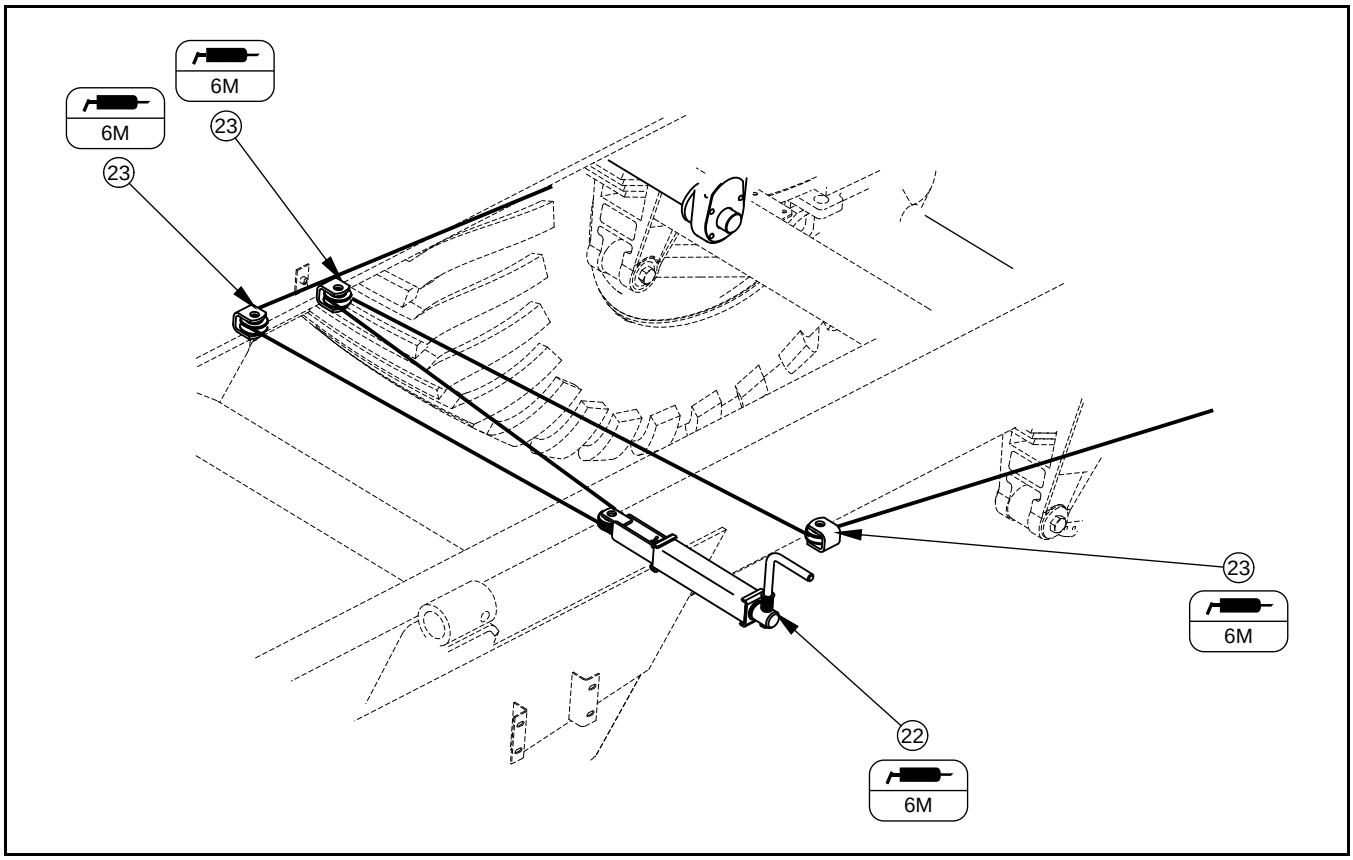


FIGURE 5.8A *TRAILER GREASING POINTS – PARKING BRAKE*

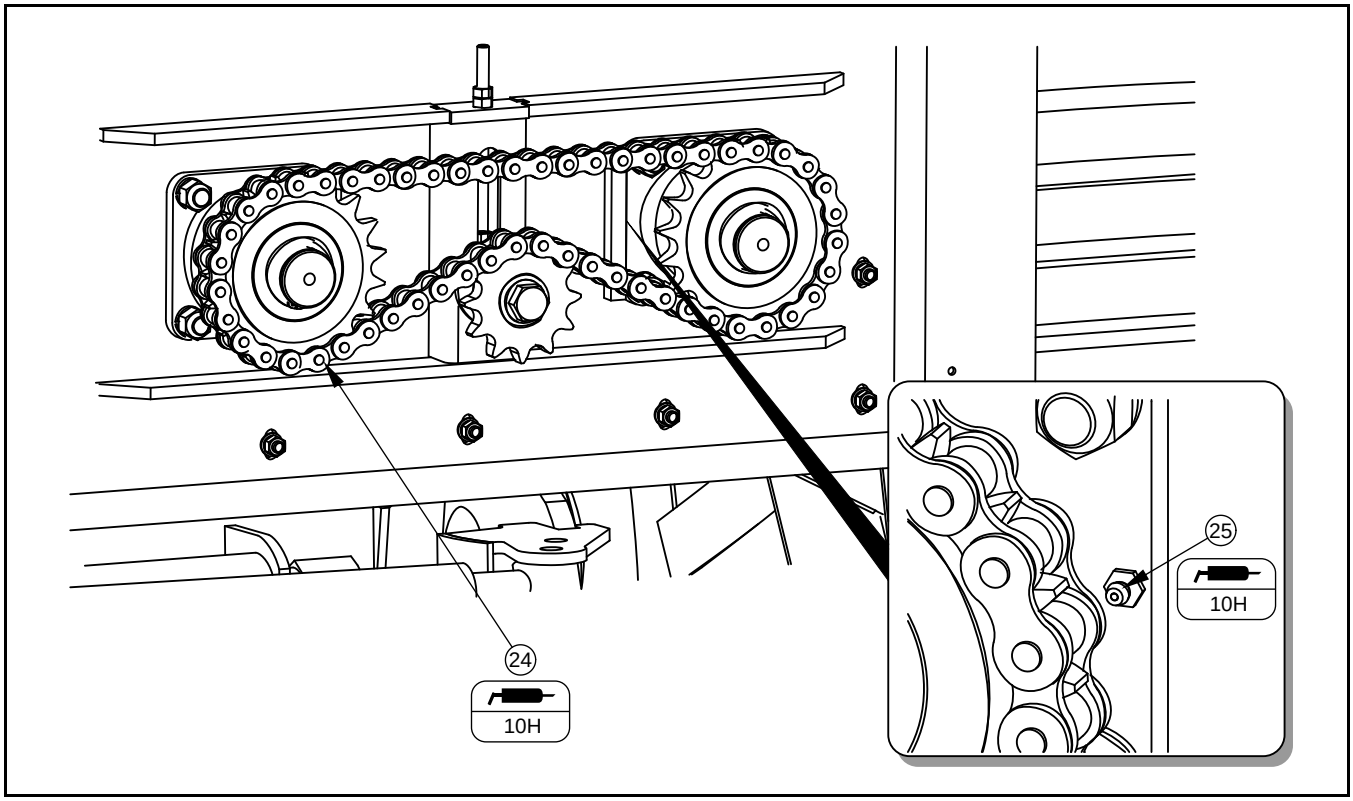


FIGURE 5.9A *TRAILER GREASING POINTS – REAR CHAIN GEARING*

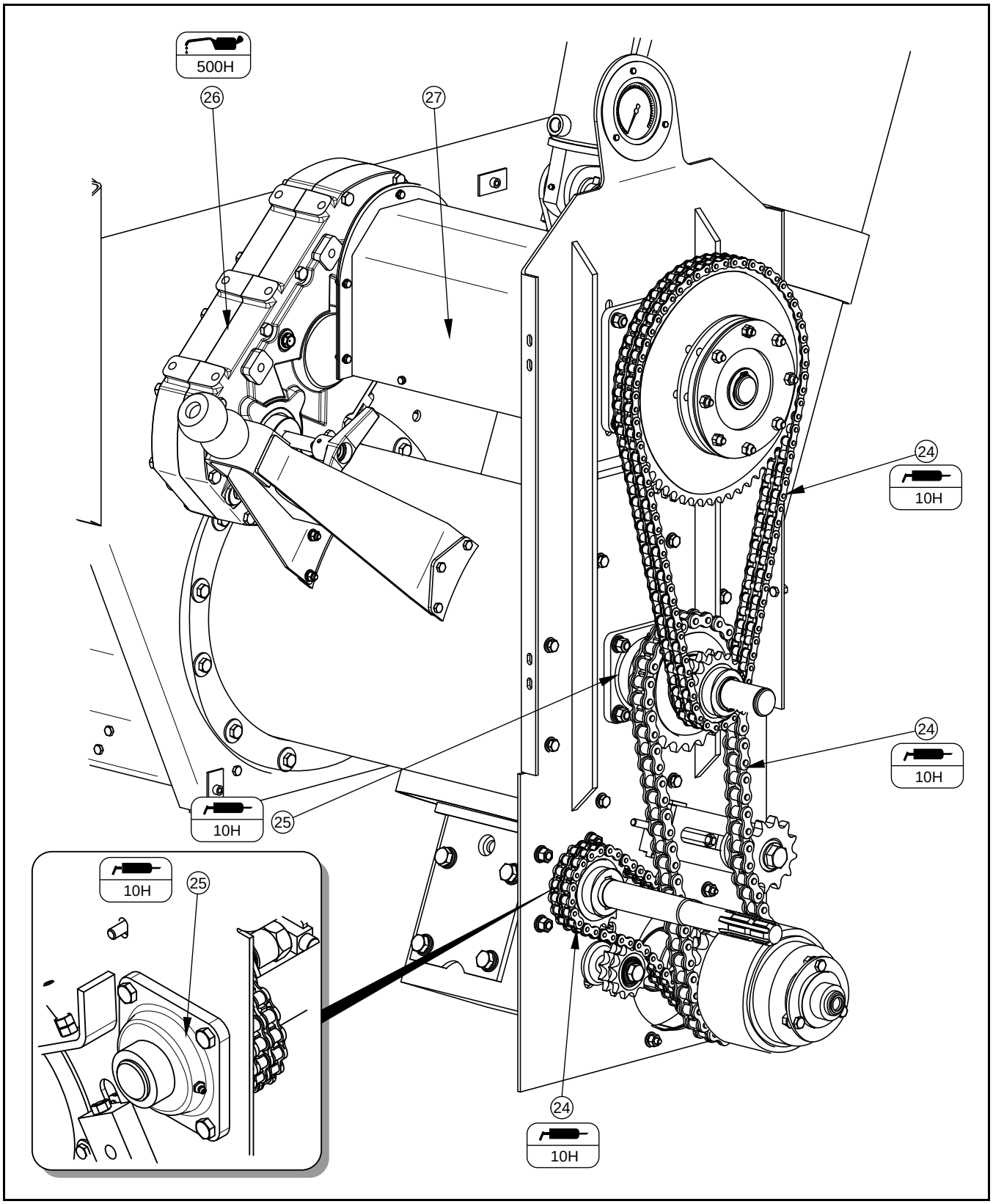


FIGURE 5.10A *TRAILER GREASING POINTS – FRONT CHAIN GEARING*

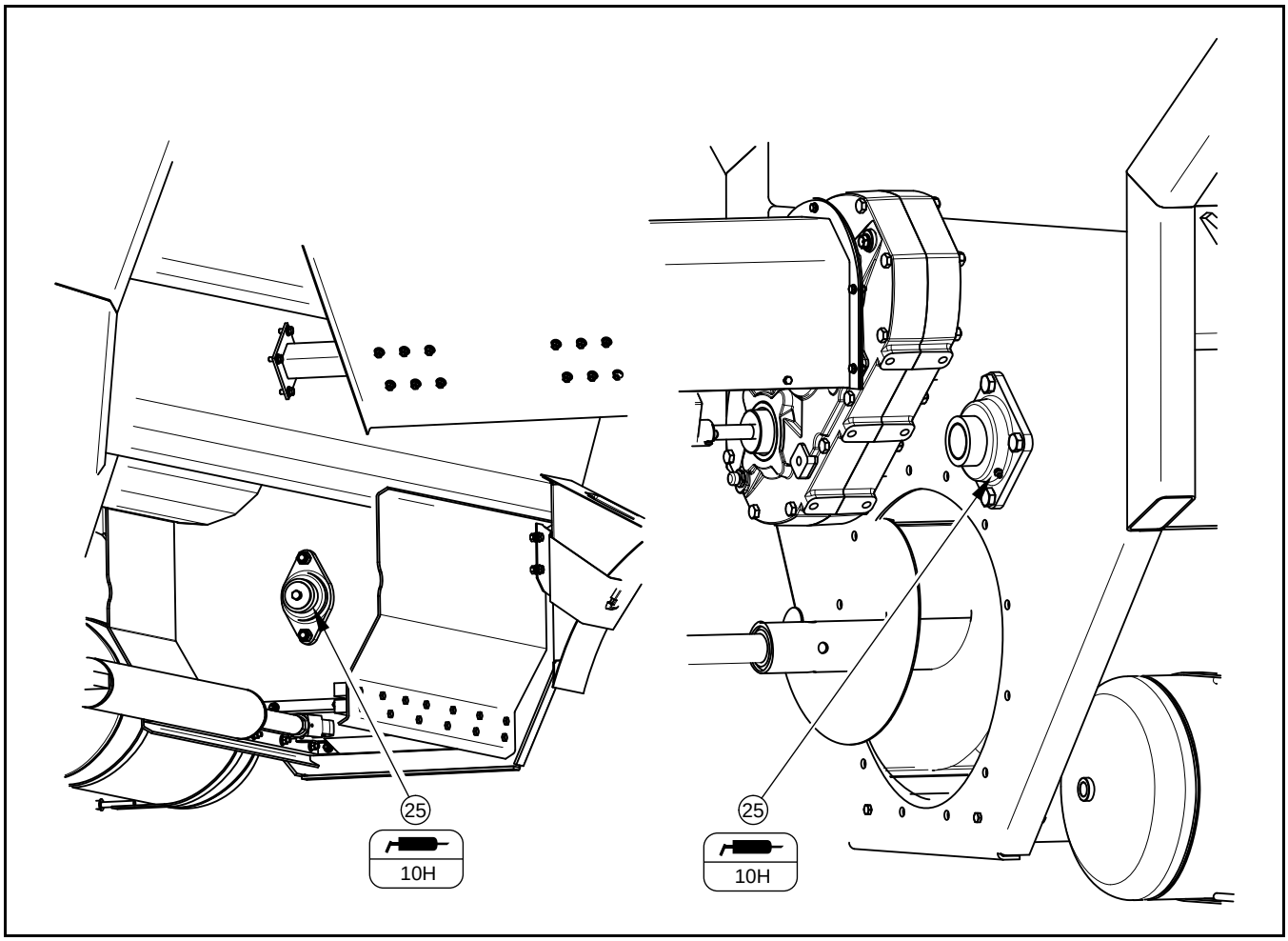


FIGURE 5.11A *TRAILER GREASING POINTS – GATHERING AUGER SHAFT AND CONTAINER AUGER SHAFT BEARING ASSEMBLY*

Arts which should be lubricated with general-purpose machine oil should be wiped with dry cleaning cloth and then a small quantity of oil should be applied do surfaces (with oil can or brush). Wipe off excess oil.

Thoroughly wash accumulated deposits off parabolic leaf springs and then after drying grease internal surfaces of leaves with anticorrosion and greasing preparation.

When using the trans-shipment trailer, the user is obliged to observe greasing instructions according to greasing schedule.

5.2.14 OPERATION NO. 14 - TECHNICAL INSPECTION OF WHEELS

Tyre pressure should be checked each time after changing spare wheel and not less than every 3 months. In the event of intensive use it is recommended to check air pressure more

frequently. During this time the trans-shipment trailer must be unloaded. Checking should be done before travelling when tyres are not heated, or after an extended period of parking.

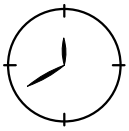
While checking pressure pay attention to technical condition of wheels and tyres. Look carefully at tyre sides and check the condition of tread. In case of mechanical damage consult the nearest tyre service and check whether the tyre defect requires tyre replacement.

Wheels should be inspected with regard to distortion, breaking of material, breaking of welds, corrosion, especially in the area of welds and contact with tyre.

Technical condition and appropriate maintenance significantly extends the life of these elements and ensures appropriate level of safety to trailer users.

DANGER

Damaged tyres or wheels may be the cause of a serious accident.



Inspection of tyre pressure and steel rims:

- every 3 months of use,
- if needed.

5.2.15 OPERATION NO. 15 - REGULATION OF CLUTCH WORKING PRESSURE

In each case after changing tractor towing the trans-shipment trailer, regulate the hydraulic clutch working pressure. Starting clutch without regulation may cause damage to it.

Required service actions

- Hitch trans-shipment trailer to tractor.
- Immobilise tractor and trailer with parking brake.
- Set cut-off valve (2) in (Z) position – closed.
- Start tractor, using hydraulic manifold supplying hydraulic clutch system.
- Using reduction valve (1), placed on connection plate (3) regulate pressure in clutch system. Nominal working clutch pressure must be set in within the range of 15 – 16 bar. Check pressure on pressure gauge (4), placed on gearing housing.

- Cut off oil flow to trailer hydraulic clutch system, turn off tractor.
- Open cut off valve (2).

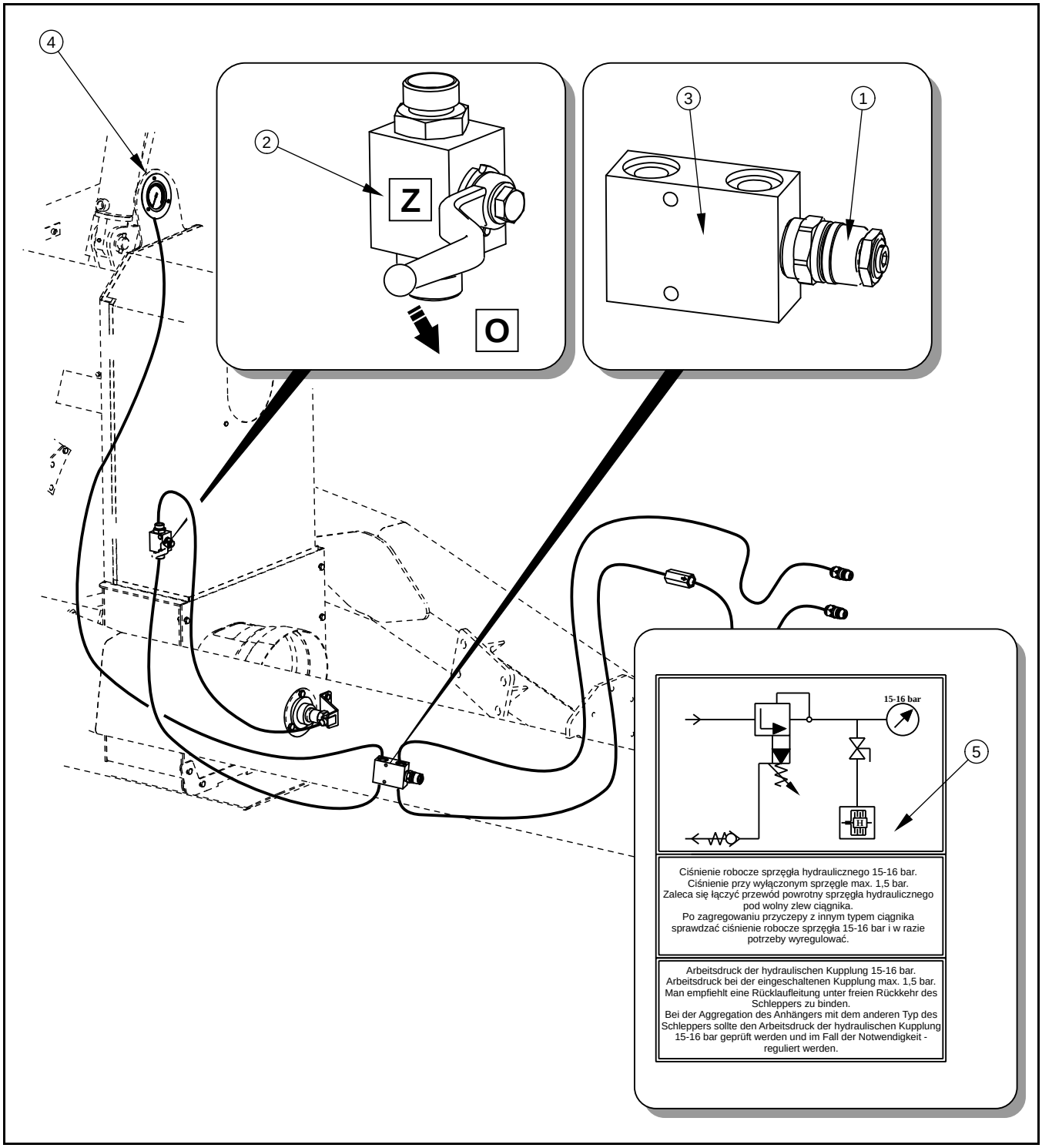


FIGURE 5.12A *REGULATION OF WORKING PRESSURE OF CLUTCH*

(1) reduction valve, (2) cut-off valve, (3) connection plate, (4) pressure gauge, (5) information sticker

TIP

When clutch is disengaged pressure remaining in system may not be greater than1.5 bar.

Clutch working pressure regulation diagram is shown on information sticker (5).

Regulation of working pressure of clutch:

- every 12 months of use.
- after each change of tractor.

5.2.16 OPERATION NO. 16 – INSPECTION OF TIGHTNESS OF FRONT CHAIN GEARING (I STAGE)

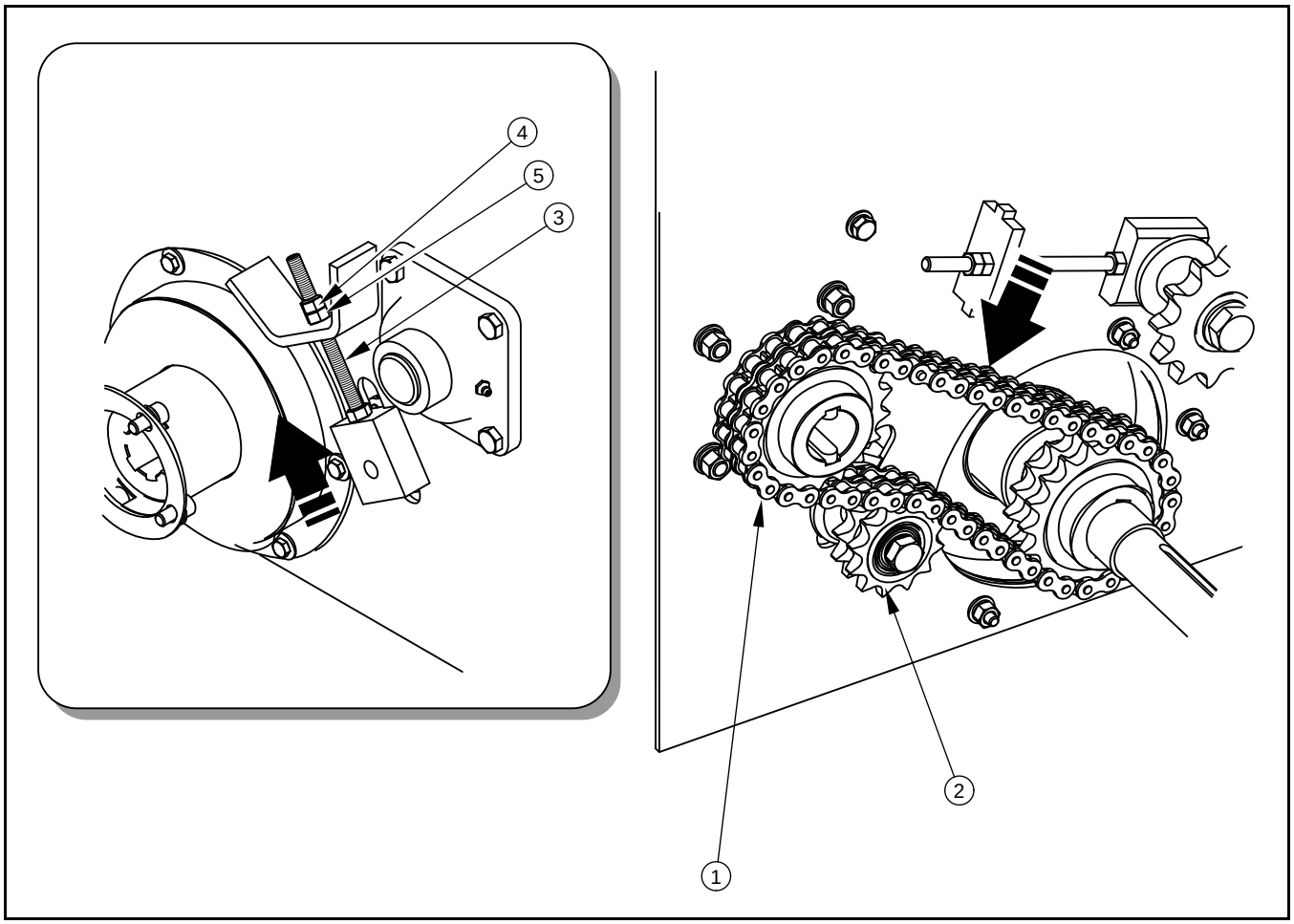
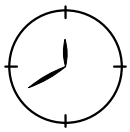


FIGURE 5.13A *I STAGE OF FRONT CHAIN GEARING*

(1) chain, (2) tensioner toothed cog, (3) tensioner bolt, (4) counter nut, (5) tightening nut

Required service actions

- Immobilise tractor and trailer with parking brake.
- Put two wedges behind the wheel, to stop machine rolling.
- Open front transmission cover.
- Check chain looseness. Press with thumb in mid-length (place marked with arrow), chain loose play should amount to 15 – 25 mm.
- If there is greater looseness then loosen counter nut (4), and nut (5) tighten chain (1). Tensioner block, joined with tensioner toothed cog (2) is moved upwards. Tensioner is placed behind transmission.
- After achieving required tightness, tighten counter nut (4).



Check drive chain tightness of the I stage of transmission gear:

- every 10 hours of work - before greasing chain.

5.2.17 OPERATION NO. 17 – INSPECTION OF TIGHTNESS OF FRONT CHAIN TRANSMISSION (II STAGE)

Required service actions

- Immobilise tractor and trailer with parking brake.
- Put two wedges behind the wheel, to stop machine rolling.
- Open front transmission cover.
- Check chain looseness. Press with thumb in mid-length (place marked with arrow), chain loose play should amount to 10 – 15 mm.
- If there is greater looseness then loosen counter nut (4), and nut (5) tighten chain (1). Tensioner block, joined with tensioner toothed cog (2) is moved left.
- After achieving required tightness, tighten counter nut (4).

Check drive chain tightness of the II stage of transmission gear:

- every 10 hours of work - before greasing chain.

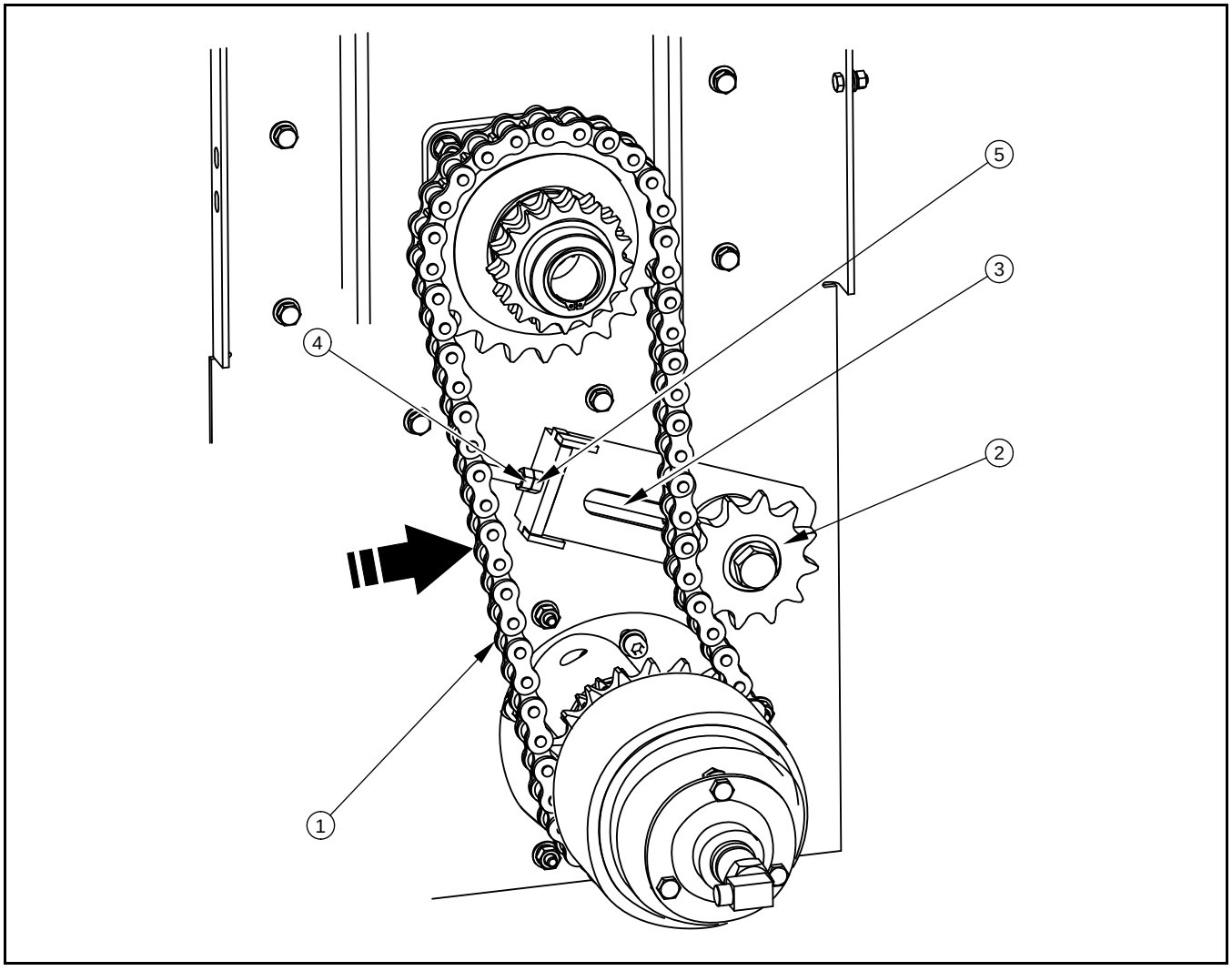


FIGURE 5.14A *II STAGE OF FRONT CHAIN TRANSMISSION*

(1) chain, (2) tensioner toothed cog, (3) tensioner bolt, (4) counter nut, (5) tightening nut

5.2.18 OPERATION NO. 18 – INSPECTION OF TIGHTNESS OF FRONT CHAIN TRANSMISSION (III STAGE)

Required service actions

- Immobilise tractor and trailer with parking brake.
- Put two wedges behind the wheel, to stop machine rolling.

Check drive chain tightness of the III stage of transmission gear:

- every 10 hours of work - before greasing chain.

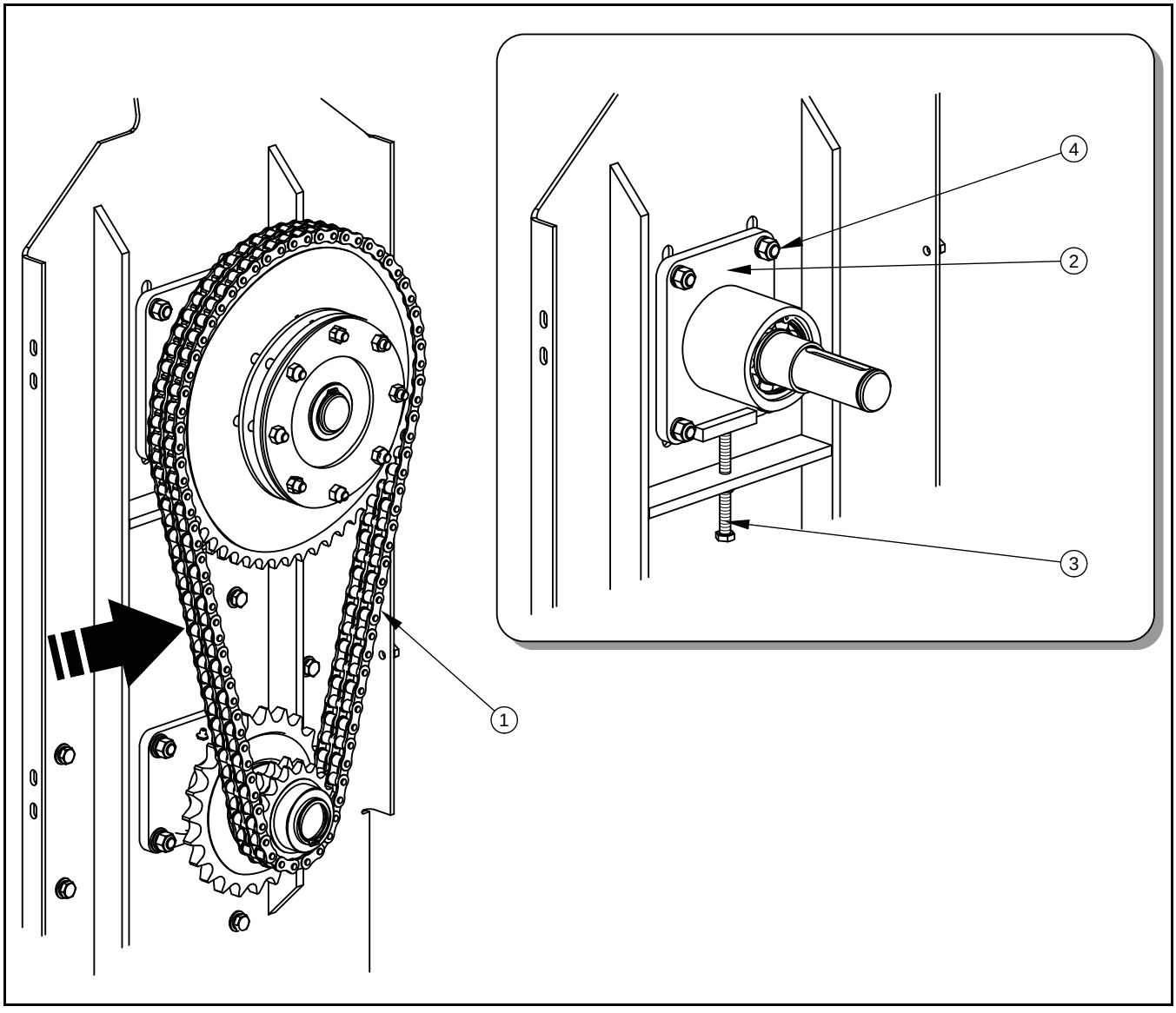


FIGURE 5.15A *III STAGE OF FRONT CHAIN TRANSMISSION*

(1) chain, (2) connector housing, (3) tensioner bolt, (4) bolt connection

- Open front transmission cover.
- Check chain looseness. Press with thumb in mid-length (place marked with arrow), chain loose play should amount to 15 – 25 mm.

- If there is too much play then loosen 4 nuts (4), using regulating bolt (3) to tighten chain (1) – connector housing (2) is moved upwards.
- After achieving required tightness, tighten nut (4).

5.2.19 OPERATION NO.19 – INSPECTION OF TIGHTNESS OF REAR CHAIN TRANSMISSION

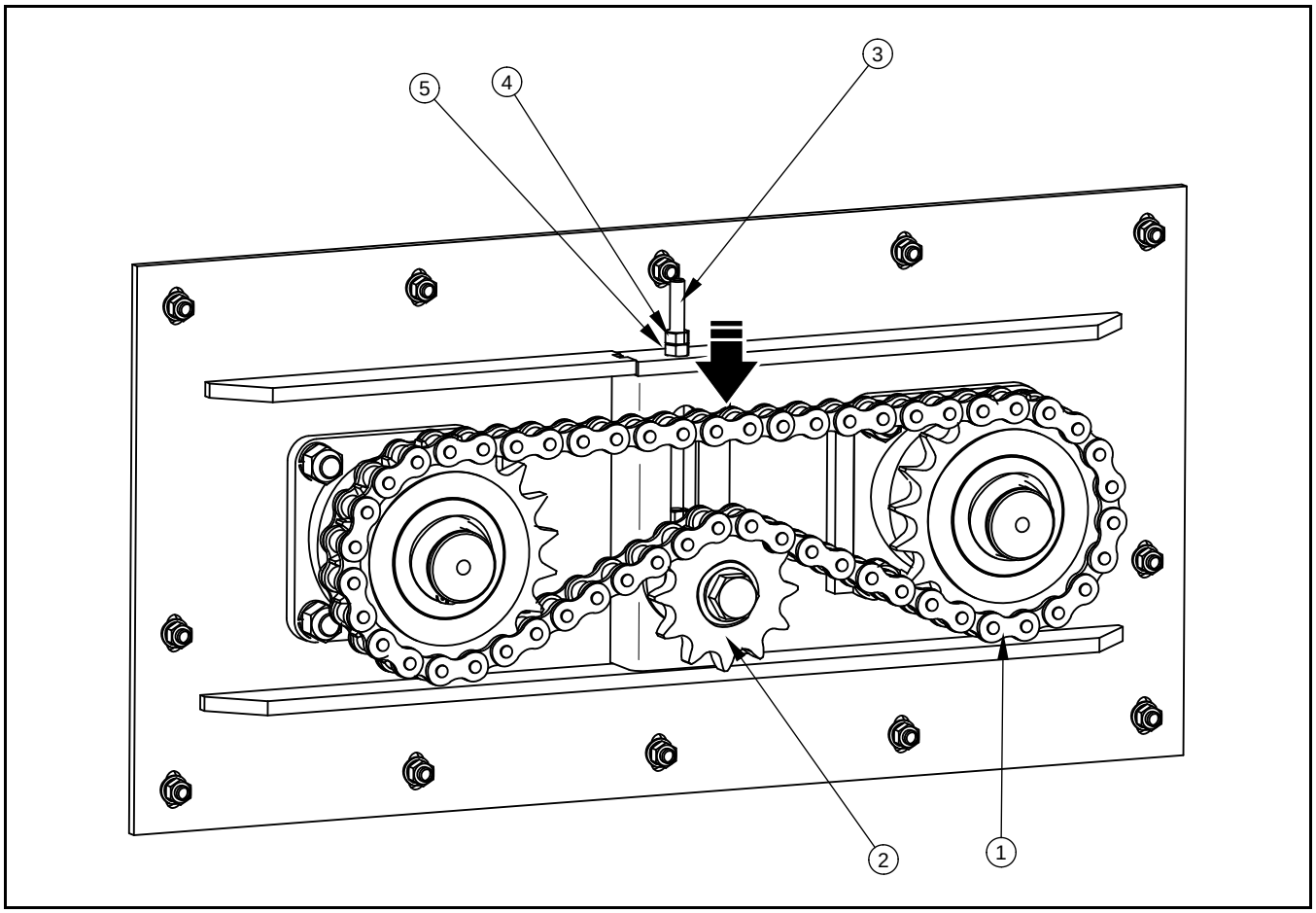


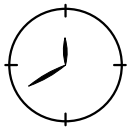
FIGURE 5.16A *REAR CHAIN TRANSMISSION*

(1) chain, (2) tensioner toothed cog, (3) tensioner bolt, (4) counter nut, (5) tightening nut

Required service actions

- Immobilise tractor and trailer with parking brake.
- Put two wedges behind the wheel, to stop machine rolling.
- Open transmission cover.
- Check chain looseness. Press with thumb in mid-length (place marked with arrow), chain loose play should amount to 15 – 25 mm.

- If there is greater looseness then loosen counter nut (4), and nut (5) tighten chain (1). Tensioner block, joined with tensioner toothed cog (2) is moved upwards.
- After achieving required tightness, tighten counter nut (4).



Inspect chain tightness of rear chain transmission:

- every 10 hours of work - before greasing chain.

5.2.20 OPERATION NO. 20 – CHANGE OIL IN FRONT GEAR WHEEL TRANSMISSION

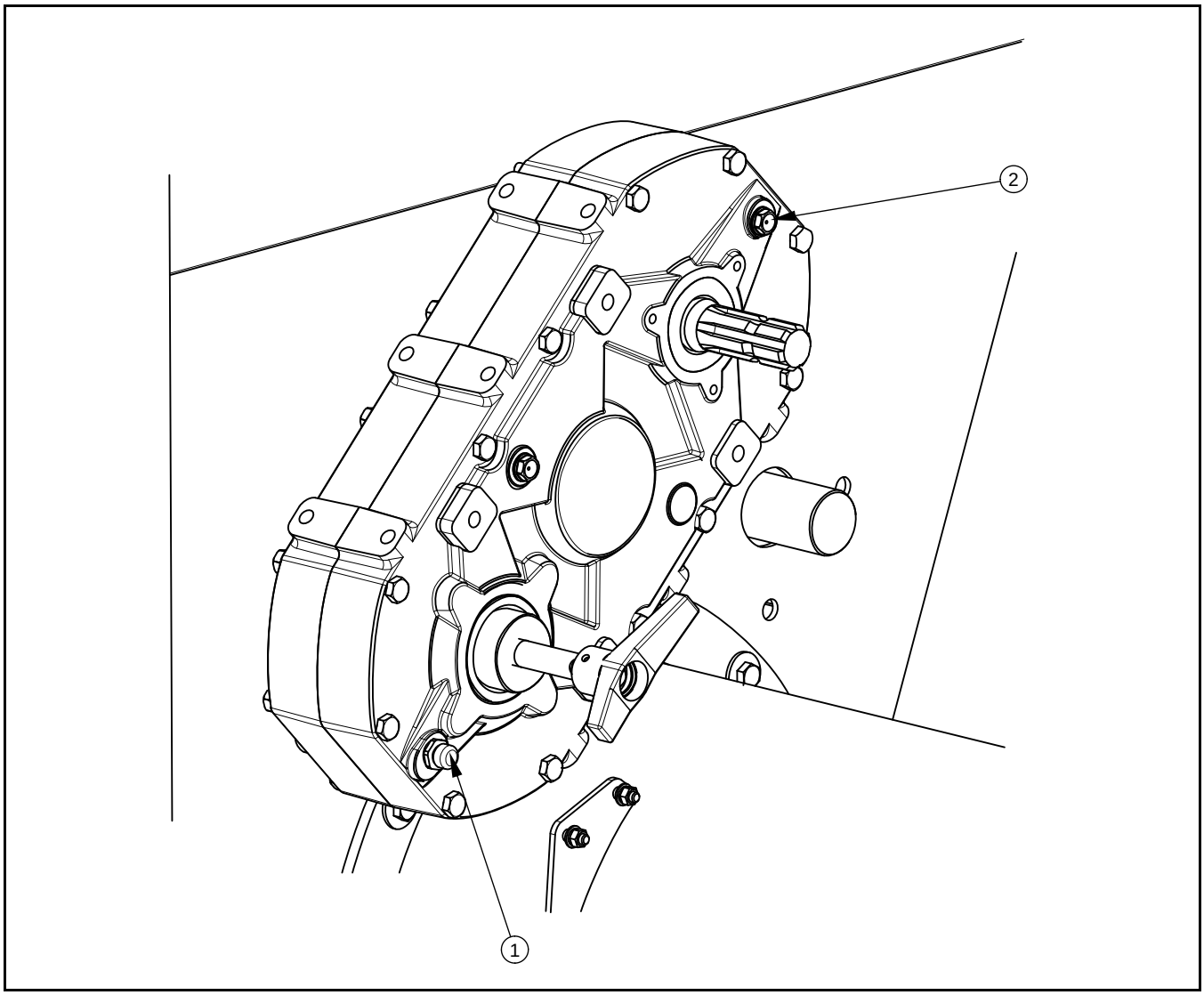
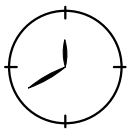


FIGURE 5.17A *FRONT GEAR WHEEL TRANSMISSION*

(1) oil drain plug, (2) oil filler plug

Required service actions

- Immobilise tractor and trailer with parking brake.
- Put two wedges behind the wheel, to stop machine rolling.
- Unscrew inlet plug (2),
- Unscrew drain plug (1).
- Drain used oil into container.
- Draw out remaining oil.
- Tighten drain plug.
- Pour in new oil (3.5 litres).
- Tighten inlet plug.



First oil change should be performed after working 50 hours and then after every 500 hours of work.

Check gearing each month for oil leaks and mechanical damage.

5.2.21 OPERATION NO. 21 – CHANGE OIL IN CONVEYOR INTERSECTING AXIS GEARING

Required service actions

- Immobilise tractor and trailer with parking brake.
- Put two wedges behind the wheel, to stop machine rolling.
- Unscrew inlet plug (2) - inlet plug is on the opposite side to the drain plug (1).
- Unscrew drain plug (1).
- Drain used oil into container.
- Tighten drain plug.
- Pour in new oil (2.3 litres).
- Tighten inlet plug.

First oil change should be performed after working 50 hours and then after every 500 hours of work.

Check gearing each month for oil leaks and mechanical damage.

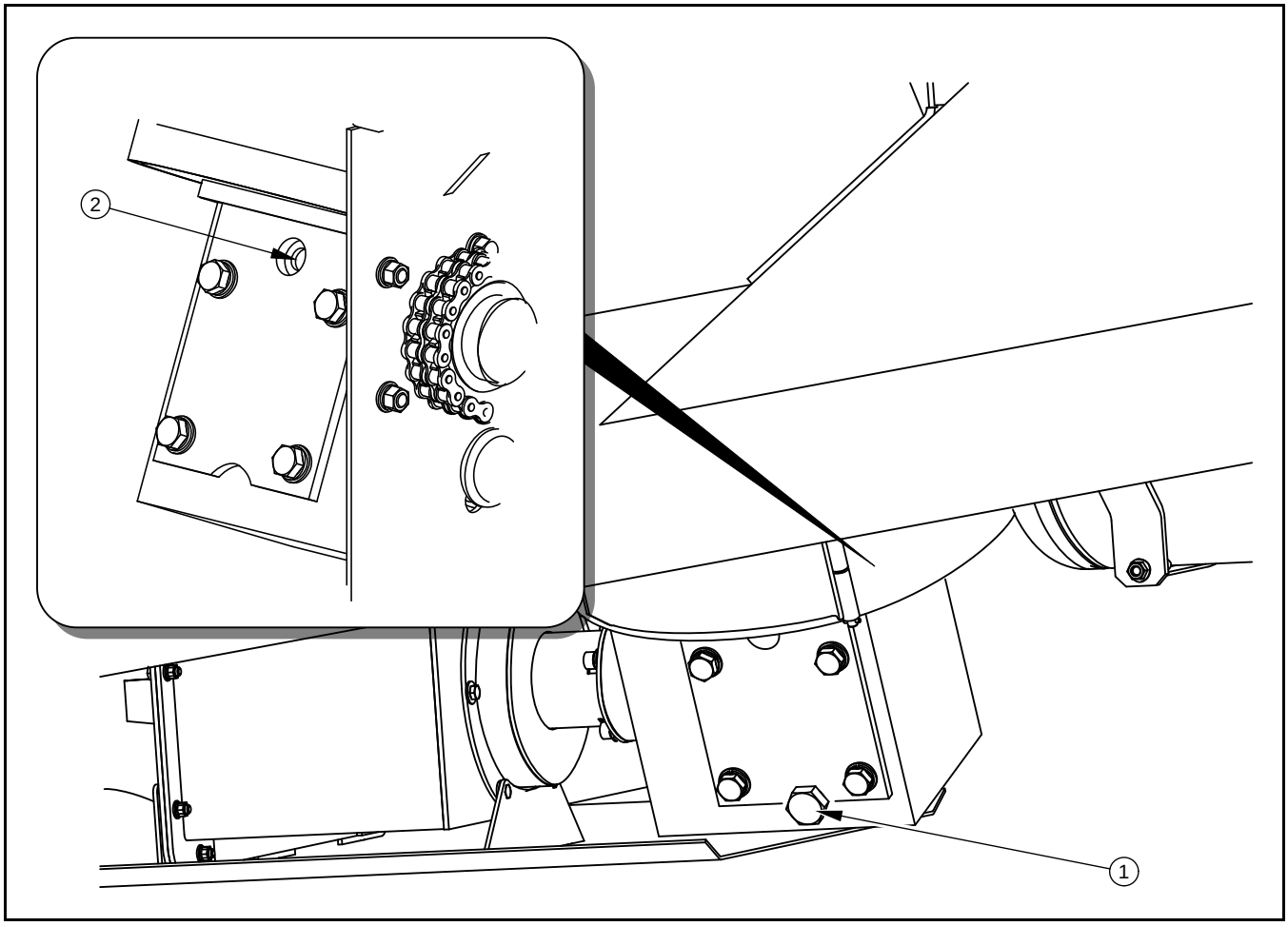


FIGURE 5.18A *CONVEYOR INTERSECTING AXIS GEARING*

(1) oil drain plug, (2) oil filler plug

5.3 UNLOADING SPEED REGULATION

The unloading time of grain (with the assumption that the PTO revolution speed is constant), is dependent on several factors:

- setting of front gear wheel transmission,
- roof cover position,
- grain tank channel slides position.

Recommended settings are shown in table below.

TABLE 5.7 ROOF AND CHANNEL SLIDES SETTING

TYPE OF LOAD	ROOF	CHANNEL SLIDE
Dry grain[1]	75% - 100%	75% - 100%
Moist grain[1]	25% - 50%	25% - 50%
All types[2]	0% - 25%	0% - 25%

[1] – setting the front gear wheel transmission (B) – RAPID REVOLUTIONS

[2] – setting the front gear wheel transmission (C) – SLOW REVOLUTIONS - long unloading time established

5.3.1 ROOF HEIGHT REGULATION

Roof placed in load box slows flow of grain direct into gathering auger conveyor hopper. In the lowest roof setting (0%) the load pours the most slowly.

Required service actions

- Immobilise trans-shipment trailer with a parking brake,
- Dismantle articulated telescopic shaft, connecting tractor with machine (if trans-shipment trailer is connected to tractor).
- Unscrew nut (2) and take out bolt.
- Move roof upwards or downwards choosing the appropriate setting.
- Insert bolt and tighten nut.

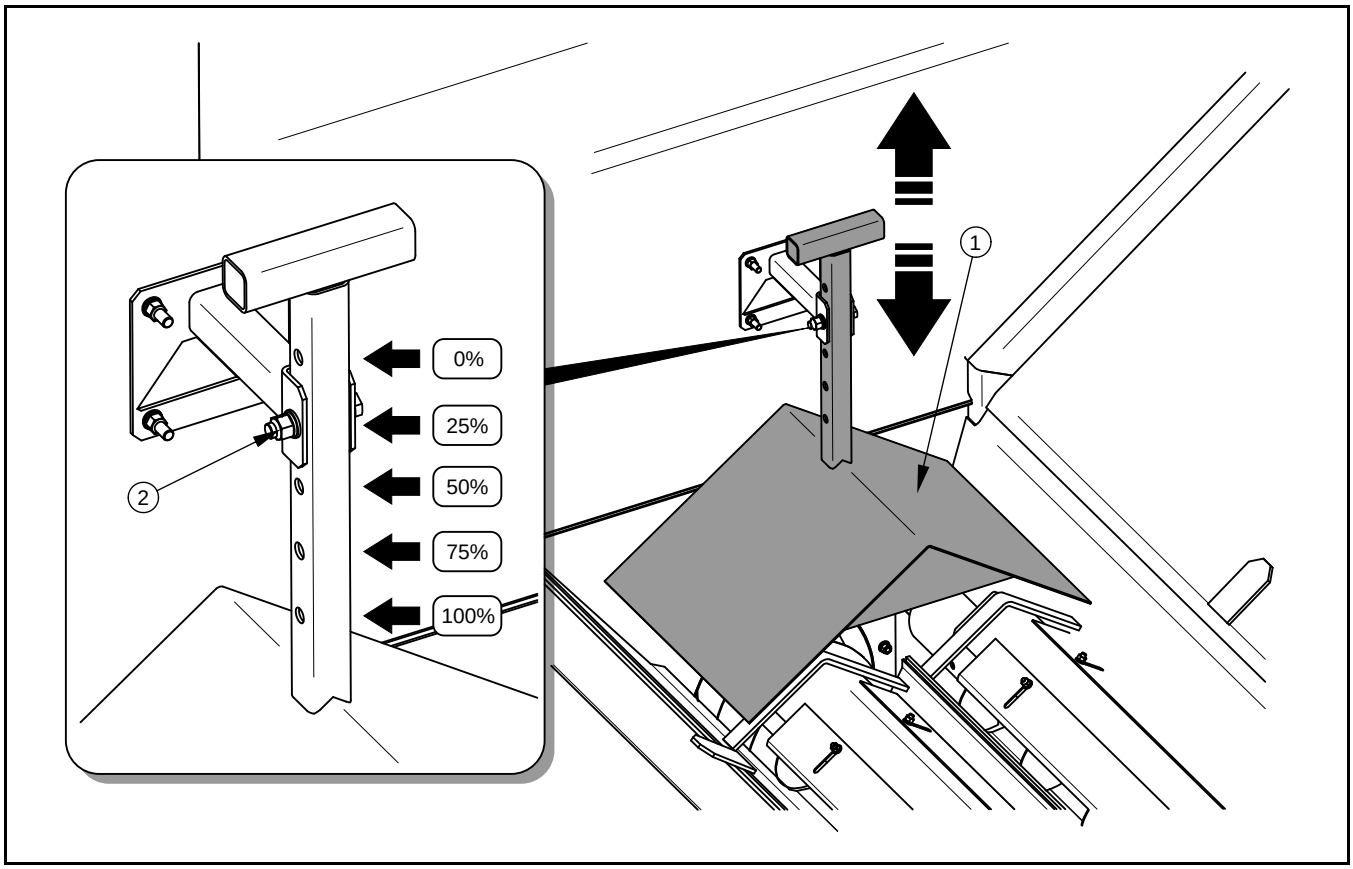


FIGURE 5.19A *ROOF HEIGHT REGULATION*

(1) roof, (2) bolt connection

TIP

Roof position regulation must be performed with empty grain tank.

DANGER

Before entering grain tank switch off tractor engine, disconnect articulated telescopic shaft, immobilise trans-shipment trailer using parking brake and secure tractor against access of unauthorised persons.

5.3.2 REGULATION OF CHANNEL SLIDES IN GRAIN TANK

Required service actions

- Immobilise trans-shipment trailer with a parking brake,

- Dismantle articulated telescopic shaft, connecting tractor with machine (if trans-shipment trailer is connected to tractor).
- Loosen two nuts (2).
- Move channel slide choosing appropriate setting.
- Tighten both nuts.
- repeat action for remaining channel slides, maintaining constant distance of slide sheets from tank sides in all elements.

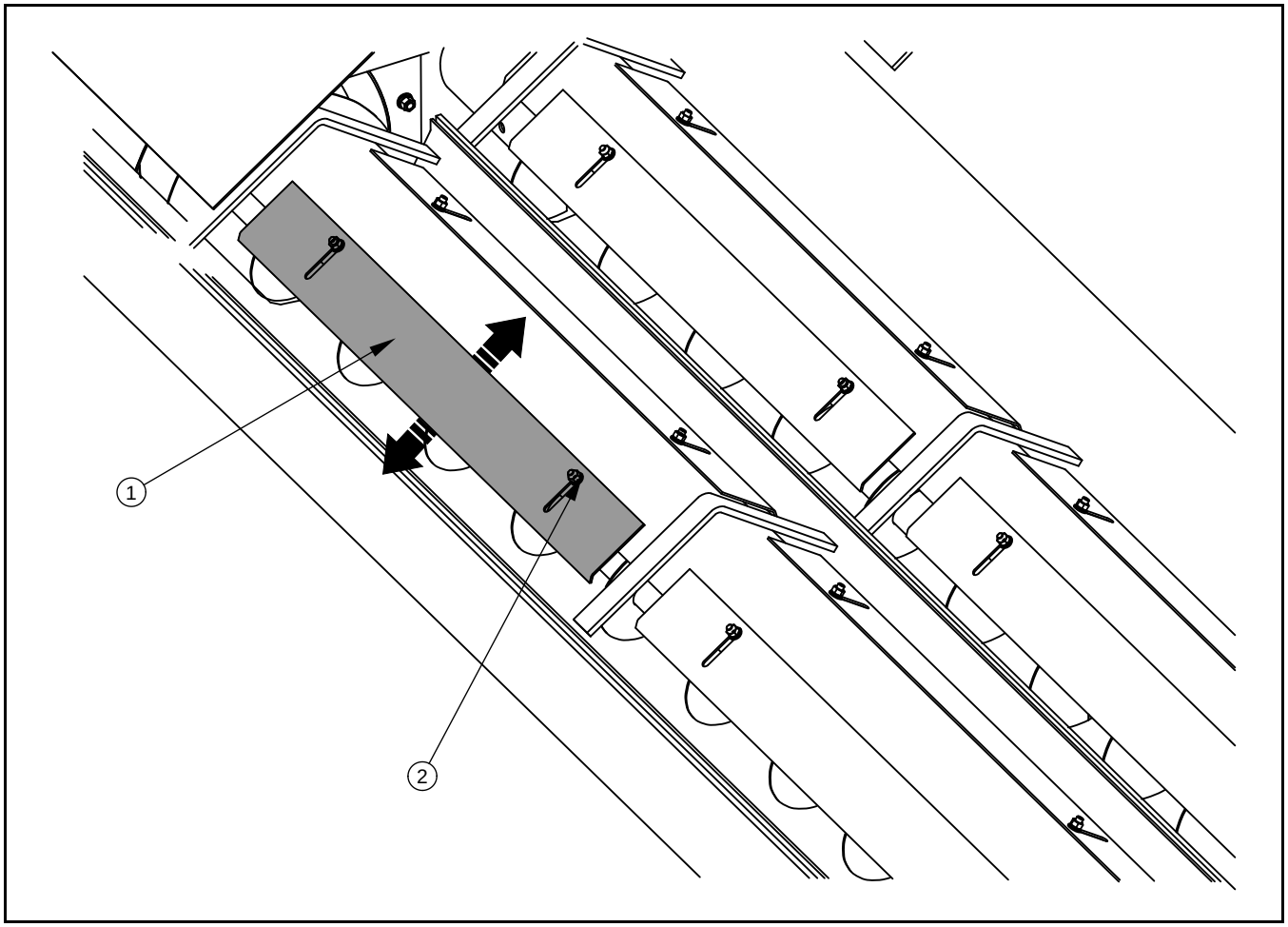


FIGURE 5.20A *CHANNEL SLIDES REGULATION*

(1) channel slide, (2) nut

TIP

Channel slide position regulation must be performed with empty grain tank.

DANGER

Before entering grain tank switch off tractor engine, disconnect articulated telescopic shaft, immobilise trans-shipment trailer using parking brake and secure tractor against access of unauthorised persons.

5.4 CONSUMABLES

5.4.1 HYDRAULIC OIL

Always adhere to the principle that the oil in the trans-shipment trailer hydraulic system and in the tractor hydraulic system are the same type. Application of different types of oil is not permitted. In a new machine system is filled with HL32 hydraulic oil.

In the event of necessity of changing hydraulic oil for another oil, check the recommendations of the oil manufacturer very carefully. If it is recommended to flush the system with the appropriate preparation, then comply with these recommendations. Attention should be given, so that chemical substances used for this purpose do not damage the materials of the hydraulic system.

TABLE 5.8 HL32 HYDRAULIC OIL CHARACTERISTICS

ITEM	NAME	VALUE
1	ISO 3448VG viscosity classification	32
2	Kinematic viscosity at 40^0C	28.8 – 35.2 mm^2/s
3	ISO 6743/99 viscosity classification	HL
4	DIN 51502 quality classification	HL
5	Ignition temperature	230 ^{o}C

The oil applied because of its composition is not classified as a dangerous substance, however long-term action on the skin or eyes may cause irritation. In the event of contact of oil with skin wash the place of contact with water and soap. Do not apply organic solvents

(petrol, kerosene). Contaminated clothing should be changed to prevent access of oil to skin. In the event of contact of oil with eye, rinse with large quantity of water and in the event of the occurrence of irritation consultant a doctor. Hydraulic oil in normal conditions is not harmful to the respiratory tract. A hazard only occurs when oil is strongly atomised (oil vapour), or in the case of fire during which toxic compounds may be released. Oil fires should be quenched with the use of carbon dioxide, foam or extinguisher steam. Do not use water to quench oil fires.

5.4.2 GREASES

For parts under great load it is recommended to apply lithium grease with molybdenum disulphide (MOS_2) or graphite additive. In the case of less loaded sub-assemblies the application of general purpose machine greases is recommended, which contain anticorrosion additive and are resistant to being washed away by water to a considerable degree.

Before starting to use greases acquaint oneself with the content off the information leaflet for the chosen product. Particularly relevant are safety principles and handling procedures for given lubricant product. Information leaflet (material safety data sheet) should be kept together with grease.

5.5 HYDRAULIC CLUTCH OPERATION

5.5.1 SAFETY ADVICE FOR HYDRAULIC CLUTCH CLEANING AND MAINTENANCE

- On no account may oil or grease come in contact with abrasive surfaces, if they do the clutch will not achieve the required torque.
- Abrasive surface may not be cleaned with solvents, i.e. benzene, acetone or kerosene. If surface is contaminated with oil, it must be replaced.
- Cleaning substances may not come into contact with the clutch.
- The clutch may not be washed under running water e.g. by hose or nozzle with stream of hot steam.

5.5.2 MOUNTING, MAINTENANCE AND CARE ADVICE

- Note: During maintenance and repair work there is a danger of burning by clutch, which has heated up during work.

- Permissible loading and maximum revs may not be exceeded.
- Attention should be given to the tightness of oil conduits and connections in steering parts.
- Incorrect dismantling of clutch may lead to damage the body. Pay attention that the clutch is under spring tension.
- Much may be subject to malfunction as a result of loosening bolts. Adhere to given tightening torque.
- Before starting remove all workshop aids and mount safety guards.

5.5.3 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

TABLE 5.9 TIGHTENING TORQUE FOR CLUTCH BOLT CONNECTIONS [(1)]

RESISTANCE CATEGORY	M6	M8	M10	M12	(M14)	M16	(M18)	M20	(M22)	M24
8.8	11.3	27.3	54	93	148	230	329	464	634	798
10.9	16.5	40.1	79	137	218	338	415	661	904	1 136

(1) – clutch manufacturer requirements

5.5.4 SERVICE INSPECTION PERIODS

Clutch service inspection periods arising from clutch application conditions. Users should check normal working condition and inspect clutch in the event of the occurrence of other noises during operation. Check silent running of roller bearings. Damaged bearings should be replaced. During inspections pay particular attention to the hydraulic oil leaks. In the event of defect notify service point in order to perform repair.

Repair of clutch during guarantee period may only be performed by service points authorised by the manufacturer.

5.6 THOROUGH LOAD TANK CLEANING

Change of grain type requires thorough cleaning of trailer tank to remove remains of previous load. The chute slide, inspection covers and conveyor covers are used for this purpose, which should be opened before beginning work. Compressed air is recommended for thorough cleaning of tank. If it is not possible to clean tank in this way then apply a stream of running water. Before loading trans-shipment trailer, it must be dried otherwise channel and conveyor may be blocked.

DANGER

Before entering grain tank switch off tractor engine, disconnect articulated telescopic shaft, immobilise trans-shipment trailer using parking brake and secure tractor against access of unauthorised persons.

Never start auger conveyor drive if tank and vertical conveyor inspection covers are open.

5.7 CLEANING TRANS-SHIPMENT TRAILER

Trailer should be cleaned depending on requirements. Before using pressure washers the user is obliged to acquaint himself with the operating principles and recommendations concerning safe use of this equipment.

Trans-shipment trailer cleaning guidelines

- Before washing trailer clean tank and conveyor off grain remains completely. Grain swells when it is moistened and its removal may become more difficult. Open chute slide, inspection covers and conveyor cover.
- To clean machine only use clean running water or water with a cleaning detergent additive with neutral pH.
- Using pressure washer increases washing effectiveness, but particular care must be taken during work. During washing washer nozzle may not be closer than 50 cm from the surface being cleaned.
- Water temperature shall not exceed 55°C.
- Do not direct water stream directly at system and equipment elements of trailer i.e. control valve, braking force regulator, brake cylinders, hydraulic cylinders,

pneumatic, electric and hydraulic plugs, lights, electrical connections, information and warning stickers, identification plates, hydraulic clutch, chain gears etc. Great water jet pressure may damage these elements.

- Do not direct water jet at individual trailer greasing points.
- For cleaning and maintenance of plastic coated surface it is recommended to use clean water or special preparations designed for this purpose.
- Do not apply organic solvents, preparations of unknown origin or other substances which may cause damage to lacquered, rubber or plastics surfaces. In the event of doubt it is recommended to make a test on an unseen surface area.
- Surfaces smeared with oil or grease should be cleaned by application of benzene extraction and then washed with clean water with added detergent.

DANGER

Familiarise yourself with instructions for application of washing detergents and maintenance preparations.

DANGER

While washing wear appropriate protective clothing and goggles protecting against splashing.

Washing detergent should be kept in original containers, optionally in replacement containers, but very clearly marked. Preparations that are harmful to health may not be stored in food and drink containers.

Container interior may only be cleaned with clean running water.

- Care for the cleanness of elastic conduits and seals. The plastic from which these elements are made may be susceptible to organic substances and some detergents. As a result of long-term reaction of some substances, the ageing process may be accelerated and risk of damage increased. Rubber elements should be maintained with the aid of special preparations after previous thorough washing.

- After finishing washing wait until trans-shipment trailer is dry and then grease all inspection points according to recommendations. Remove excess oil or grease with a dry cloth.
- Observe environmental protection principles and wash trans-shipment trailer in a place designated for such purpose.

5.8 STORAGE

Trans-shipment trailer should be stored in a completely enclosed or roofed building.

If the trans-shipment trailer will not be used for a long time, it is essential to protect it from adverse weather, especially rust and accelerated tyre deterioration. During this time trailer must be unloaded. Trans-shipment trailer should be very carefully washed and dried. Corroded places should be protected using undercoat paint and then painted with surface paint according to colour scheme.

In the event of prolonged work stoppage, it is essential to lubricate all elements regardless of the period of the last lubrication process - does not apply to changing oil in gearing units. Chains should be taken off and carefully washed if suitable for further use, reinstalled and smeared generously with grease.

Wheel rims and tyres should be carefully washed and dried. During longer storage of unused trans-shipment trailer, it is recommended that every 2 to 3 weeks the trailer may be moved a bit so that the place of contact of tyres with ground is changed. So that tyres are not deformed and maintain proper geometry. Also tyre pressure should be inspected from time to time, and if necessary pressure should be increased to appropriate value.

Weigher indicator panel must be kept in a dry room together with electrical supply lead.

5.9 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

Unless other tightening parameters are given, during maintenance repair work apply appropriate torque to tightening nut and bolt connections. Recommended tightening torque of most frequently applied nut and bolt connections are given in table below. Given values apply to non greased steel bolts.

TABLE 5.10 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

THREAD METRIC	5.8(1)	8.8(1)	10.9(1)
	M_D [Nm]		
M10	37	49	72
M12	64	85	125
M14	100	135	200
M16	160	210	310
M20	300	425	610
M24	530	730	1 050
M27	820	1 150	1 650
M30	1 050	1 450	2 100

(1) – resistance class according to DIN ISO 898 standard

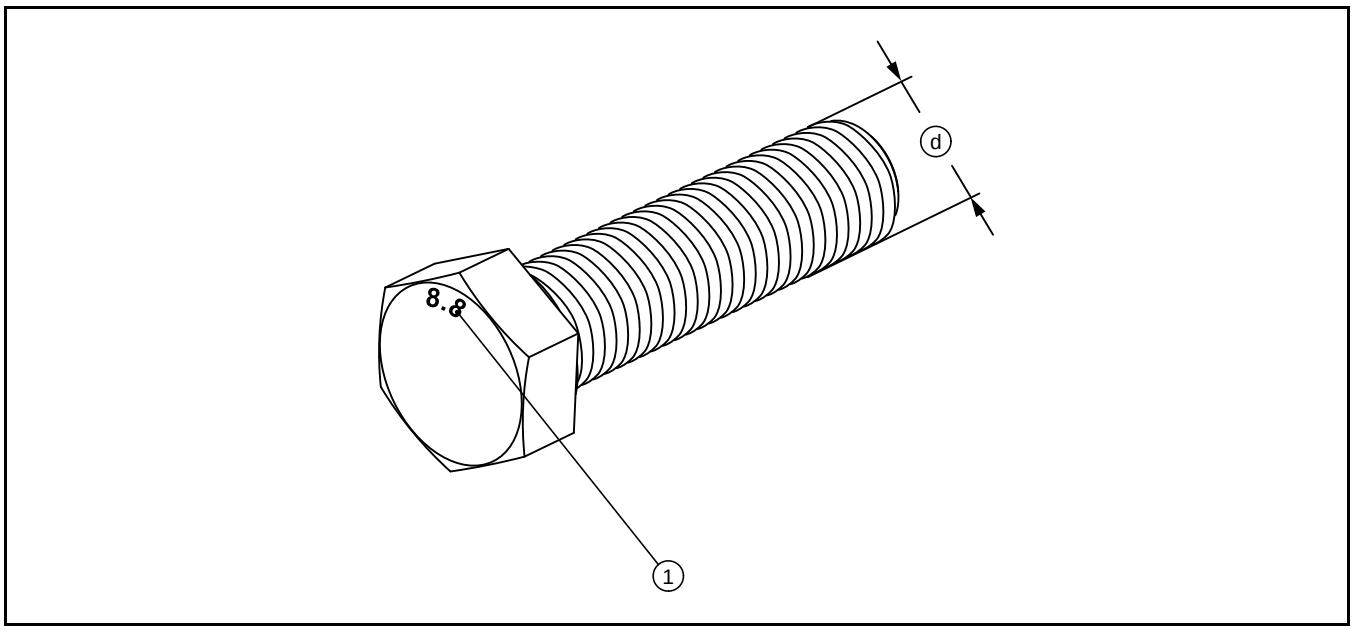


FIGURE 5.21A *BOLT WITH METRIC THREAD*

(1) resistance class, (d) thread diameter

5.10 LIST OF BULBS

TABLE 5.11 LIST OF BULBS

LAMP	BULB
Rear lamp group (1)	R10W – 4 units P21W – 4 units. PY21W – 1 unit. T4W – 1 unit.
License plate light (1)	C5W – 1 unit.

(1) – Number of bulbs applies to one lamp

5.11 FAULTS AND MEANS OF REMEDYING THEM

TABLE 5.12 FAULTS AND MEANS OF REMEDYING THEM

FAULT	CAUSE	REMEDY
Problem with moving off	Brake system pneumatic conduits not connected	Connect brake conduit.
	Applied parking brake	Release parking brake.
	Insufficient pressure in break system	Check pressure on tractor pressure gauge, wait till compressor fills tank to required pressure. Damaged air compressor in tractor Repair or replace. Damaged brake valve in tractor. Repair or replace. Leaking system conduit or connections. Check systems for tightness.
	Damaged pneumatic system connection conduit	Replace.
	Leaking connections	Tighten, replace washers or seal set, replace conduits.
	Damaged control valve or	Check valve, repair or replace.

FAULT	CAUSE	REMEDY
	brake force regulator	
Noise in axle hubs	Excessive slack in bearings	Check slack and regulate if needed
	Damaged bearing	Replace bearing
Excessive heating of axle hubs	Incorrect main or parking brake regulation	Regulate setting of expander arms
	Worn brake linings	Change brake shoes
Incorrect hydraulic system operation	Improper hydraulic oil viscosity	Check oil quality, make sure that the oil in both machines is at the same type. If necessary change oil in tractor or in trailer
	Insufficient tractor hydraulic pump output, tractor's hydraulic pump damaged.	Check tractor's hydraulic pump.
	Damaged or contaminated ram cylinder	Check cylinder ram piston (bending, corrosion), check ram cylinder for tightness (piston seal), in case of need repair or replace ram cylinder.
	Excessive cylinder ram loading	Check mechanism controlled by ram cylinder for mechanical damage
	Damaged hydraulic conduits	Check and ascertain that hydraulic conduits are tight, not fractured and properly tightened. If necessary replace or tighten.
Jerking, uneven trailer braking.	Damaged or unconnected brake system supply conduit	Check conduit, check connection socket. Repair, change or connect conduit.
Hydraulic clutch does not transfer required torque.	Worn out abrasive ring	Install a new abrasive ring
	Grease on abrasive surface	Grease contaminated surface of steel or cast iron may be washed with benzene or acetone. Change abrasive ring.

FAULT	CAUSE	REMEDY
	Insufficient working pressure	Check pressure and set at required value.
Clutch heats to over 120°C when connected	Springs slips because oil pressure is too low	Check pressure and set at required value.
	Worn out abrasive ring	Install a new abrasive ring
Clutch heats when disconnected	Cone shield resting on pin	Restore slow rotation to cone shield on pins.
	Cone shield does not reduce speed, because pressure in cylinder is too great.	Ensure proper cylinder air venting.
	Cone shield does not reduce speed, because is resting on pressure spring.	Install a new pressure spring.

NOTES